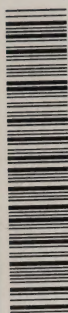



Government
Publications



3 1761 11555636 7



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

DOMINION OF CANADA

8571

SIXTY-SECOND

ANNUAL REPORT

OF THE

FISHERIES BRANCH

Department of Marine and Fisheries

FOR THE YEAR

1928-29



OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1929

DEPUTY MINISTER'S REPORT

CONTENTS

To His Excellency the Right Honourable Viscount Willingdon, G.C.S.I.,
G.C.M.G., G.C.I.E., G.B.E., Governor General and Commander in Chief
of the Dominion of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of Your Excellency and the Parliament of Canada, the Sixty-second Annual Report of the Fisheries Branch of the Department of Marine and Fisheries.

I have the honour to be,

Your Excellency's most obedient servant,

P. J. ARTHUR CARDIN,

Minister of Marine and Fisheries.

DEPARTMENT OF MARINE AND FISHERIES,

OTTAWA, July, 1929.

CONTENTS

	PAGE
Deputy Minister's Report, covering—	
Review of the Fisheries of the calendar year 1928.....	5
Operation of the Fish Inspection Act.....	16
Inspection of Canneries and Canned Fish.....	17
Marine Biological Board.....	17
Fisheries Intelligence Service.....	19
Fishing Bounty.....	19
Fish Collection Services.....	21
Fish Culture.....	21
Oyster Development, Prince Edward Island.....	24
Scallop and Oyster Investigations.....	25
Royal Commission on Atlantic Fisheries.....	26
North American Committee on Fishery Investigations.....	30
International Halibut Commission.....	32
Fraser River Sockeye Salmon Treaty.....	33
Gloucester County Fishermen's Association.....	38

APPENDICES

1. Report of Supervisors of Fisheries.....	40
2. Report on Work of Marine Biological Board.....	121
3. Report of the Director of Fish Culture.....	140
4. Report on Scallop Investigations.....	210
5. Report on Oyster Development, Prince Edward Island.....	212
6. Report of Fisheries Engineer.....	214
7. Statement of Revenue and Expenditure, 1928-29.....	220
8. Statement of Revenue and Expenditure, 1867-1928.....	234
9. Entries of United States Fishing Vessels (Pacific).....	246
10. Entries of United States Fishing Vessels (Atlantic).....	251
11. Summary of Licenses Issued.....	253
12. Return of Prosecutions.....	256

DEPUTY MINISTER'S REPORT

To the Hon. P. J. A. CARDIN,
Minister of Marine and Fisheries.

SIR,—I have the honour to submit the Sixty-second Annual Report of the Fisheries Branch of the department, which is for the fiscal year ended March 31, 1929, and is my first report as Deputy Minister of Fisheries.

The following subjects are dealt with in the report:—

- Review of the Fisheries of the calendar year 1928.
- Operation of the Fish Inspection Act.
- Inspection of Canneries and Canned Fish.
- Marine Biological Board.
- Fisheries Intelligence Service.
- Fishing Bounty.
- Fish Collection Services.
- Fish Culture.
- Oyster Development, Prince Edward Island.
- Scallop and Oyster Investigations.
- Royal Commission on Atlantic Fisheries.
- North American Committee on Fishery Investigations.
- International Halibut Commission.
- Fraser River Sockeye Salmon Treaty.
- Gloucester County Fishermen's Association.

Appendices to the report include:—

- Reports of the Supervisors of Fisheries.
- Report on the Work of the Biological Board.
- Report of the Director of the Fish Culture Division.
- Report on Scallop Investigations.
- Report of the Fisheries Engineer.
- Report on Oyster Development in Prince Edward Island.
- Statement of Fisheries Expenditure and Revenue, 1928, and statement of Fisheries Expenditure and Revenue by provinces, 1867-1928.
- Summary of Licenses Issued.
- Return showing Prosecutions for Offences against the Fisheries Act.
- Entries of United States Fishing Vessels on the Pacific Coast and on the Atlantic Coast.

REVIEW OF THE FISHERIES OF 1928

Canada's fisheries production in the calendar year 1928 reached a total of \$55,050,973 in marketed value, or \$5,927,364 above the total for 1927. Only once before, save in 1918 and 1919 when the inflated prices of the war era prevailed, have the Dominion's fisheries yielded a larger sum than in 1928. That exception was in 1926 when unusually favourable weather conditions greatly aided the fishermen and the marketed value of the production amounted in all to \$56,360,633, or \$1,309,660 more than in 1928.

During 1928 there were increased catches both on the Atlantic coast—that is, in the sea fisheries of the Maritime Provinces and Quebec—and on the Pacific coast. The catches in the inland waters showed a slight net decrease, attributable

to smaller landings in Ontario and Manitoba. The marketed value of the sea fisheries production was \$46,669,222, as compared with \$41,547,697 in the previous calendar year. In the case of the inland fisheries the marketed value of the production amounted to \$8,381,751, an increase of \$805,839 over the figures for 1927.

On the whole, prices were somewhat better in the fisheries trade in 1928 than they had been in the previous year and this condition, together with the increase in catch, made the year a more prosperous one for the fishermen than its predecessor had been. Export business showed substantial growth. Canadian fish and fish products were sold in some 100 foreign markets and the total exportation had a value of \$38,096,245, as against \$34,814,448 in 1927. The 1928 balance of trade in Canada's favour on fisheries account was \$34,028,171.

The number of men employed in the catching and landing of fish—the primary operations of the fisheries—was 62,785, as compared with 63,415 in the preceding year, and in the fish canning and curing establishments 15,434 persons were employed, as against 16,697 the year previously—a total personnel of 78,219 directly engaged in the fishing industry, or 1,893 fewer than in 1927.

Capital investment showed some increase. It amounted to \$58,072,371, which was \$1,765,910 greater than in 1927. Capital represented by the fish canning and curing establishments was \$26,941,283, or an increase of \$2,486,801, despite a net decrease in the number of plants operated. There was a decrease in the number of lobster and salmon canneries, but their combined output was larger than in the year before. More clam canneries and fish curing plants were in operation than in 1927. The number of fish reduction plants was also larger. In the primary operations the value of the vessels, boats, and gear in use was \$31,131,088, as compared with approximately \$720,000 more than that in the preceding year.

The interesting point will be noted that though there was a decrease in the number of persons engaged in the industry in 1928 as compared with 1927 the catch and marketed value for the Dominion as a whole were both larger in 1928 than they had been in the previous year. Increasing use of powered craft and mechanical equipment in the fisheries is enlarging the productive capacity of the individual worker in the industry. The widening application of power in the fisheries is a factor which must be taken into the reckoning in any analysis of the changes from year to year in the size of personnel engaged in the industry.

It is also to be noted that while there was some increase in the capital investment in the industry in 1928, the indications are that there will be a further increase in the ensuing year. On the Atlantic coast, for instance, greater investment is being made in the facilities for primary operations. During the winter no less than 155 new fishing boats have been under construction at Maritime Province points, the greater number of them in Nova Scotia. There has been more activity in this regard in the Maritime Provinces during the past winter than for some years—a condition partly attributable to the greater success met with by the fishermen during 1928 and partly, it is indicated, to the establishment by the department of fish collection services—referred to elsewhere in this review, which, by widening the marketing opportunities of the fishermen, are encouraging them to increase their facilities for fishing.

Reckoning in terms of marketed value, forty-eight per cent of the Dominion's fisheries production for 1928 is to be credited to British Columbia. The Maritime Provinces accounted for thirty-two per cent, Ontario for seven per cent, the Prairie Provinces and the Yukon Territory, together, for seven per cent, and Quebec for six per cent. Only in the case of one of the provinces, Prince Edward Island, was there a decrease (\$171,126) in marketed value as compared with 1927.

From the standpoint of marketed return, the salmon fishery was first in importance during the year and the total production from this fishery, increasing by some \$3,000,000 as compared with the year before, had a value of \$17,867,053. The cod fishery ranked next with a production valued on the markets at \$6,285,777. The lobster fishery was third in marketed value—\$5,183,988. In the case of both halibut and herring the year's production amounted to more than \$3,000,000. Pilchard production was above the \$2,000,000 mark and the marketed value of the catch of whitefish, most important among the inland fish from the standpoint of marketed return, was also more than \$2,000,000. The haddock, pickerel, sardine, smelt, and trout fisheries, respectively, yielded marketed values of over \$1,000,000.

Table I below shows the marketed value of the year's production by provincial totals as compared with the three preceding years, and table II the marketed value of sea and inland production by provinces for 1928.

TABLE I

—	1928	1927	1926	1925
	\$	\$	\$	\$
Nova Scotia.....	11,681,995	10,783,631	12,505,922	10,213,779
New Brunswick.....	5,001,641	4,406,673	5,325,478	4,798,589
Prince Edward Island.....	1,196,681	1,367,807	1,358,934	1,598,119
Quebec.....	2,996,614	2,736,450	3,110,964	3,044,919
Ontario.....	4,030,753	3,670,229	3,152,193	3,436,412
Manitoba.....	2,240,314	2,039,738	2,328,803	1,466,939
Saskatchewan.....	563,503	503,609	444,288	494,882
Alberta.....	725,050	712,469	749,076	458,504
British Columbia.....	26,562,727	23,264,342	27,367,109	22,414,618
Yukon Territory.....	51,665	12,090	17,866	15,370
Total.....	55,050,973	49,497,038	56,360,633	47,942,131

TABLE II

—	Sea	Inland	Total
	\$	\$	\$
Nova Scotia.....	11,681,995	.....	11,681,995
New Brunswick.....	4,973,562	28,079	5,001,641
Prince Edward Island.....	1,196,681	.....	1,196,681
Quebec.....	2,254,257	742,357	2,996,614
Ontario.....	.....	4,030,753	4,030,753
Manitoba.....	.....	2,240,314	2,240,314
Saskatchewan.....	.....	563,533	563,533
Alberta.....	.....	725,050	725,050
British Columbia.....	26,562,727	.....	26,562,727
Yukon Territory.....	.....	51,665	51,665
	46,669,222	8,381,751	55,050,973

NOVA SCOTIA

In Nova Scotia the year's production of \$11,681,995 was nearly \$900,000 above the total for 1927 and was only \$823,927 under the figure for 1926, which, as has been noted, was a year of unusually favourable natural conditions. In the cod fishery there was an increase of almost 14,000,000 pounds in catch and of slightly more than \$950,000 in marketed value. There were also increases in the catch and marketed value of haddock, pollock, hake and cusk, and swordfish among the other principal sea fish and an increase in the marketed value of mackerel, but decreases, on the other hand, in the case of halibut, herring, lobsters, and salmon. The scallop catch fell off sharply as compared

with 1927, but was substantially larger than it had been in any other previous year. There was some gain in the landings and marketed value of clams and quahaugs. Favourable prices in the dried fish markets were an important factor in increasing the total value of the provincial production for the year. The total catch of the Lunenburg fleet, which operates chiefly for the dried fish trade, was 717,225 hundredweight of green fish as compared with 682,770 hundredweight in 1927, though the number of vessels operating, seventy-five, was eight less than in the previous year.

NEW BRUNSWICK

The year was a very successful one for the New Brunswick fishing industry and the total marketed value of the provincial catch, \$5,001,641, was nearly \$600,000 greater than the 1927 return. The sardine fishery, which is of steadily growing importance and in which there was a catch during the year of 55,869,800 pounds with a marketed value of \$1,284,771, accounted for more than \$238,000 of the 1928 gain in the value of the provincial fisheries as a whole. Similarly, smelt production was more valuable by over \$225,000 than it had been in the previous year when a catch of 4,618,400 pounds had a marketed value of \$686,163 as compared with a marketed value of \$912,055 for a catch of 5,986,600 pounds in the year under review. There was a very large increase relatively in the catch of pollock and the marketed value of \$55,297 was \$41,000 above the 1927 total. Mackerel catch was double that of the previous year while there was substantial increase in catch and value in the cod fishery as well as in the lobster fishery. On the other hand, production fell off in the alewives, herring, and salmon fisheries.

PRINCE EDWARD ISLAND

In the case of Prince Edward Island the mackerel fishery was more successful in 1928 than it had been in the preceding year, both in point of size of catch and its value when put upon the market, and while the herring catch was smaller by some 400,000 pounds than in 1927 it brought in a slightly larger amount in marketed value. The oyster landings increased by nearly 700 barrels but marketed value was not quite as large as in the year before. There was a decrease of \$103,794 in the value of the lobster marketings although the catch of 6,561,300 pounds was 281,300 pounds above the 1927 total. Smelt and cod landings fell off somewhat and in the case of each fishery there was a substantial decline in marketed value.

QUEBEC

Of the total gain of \$260,164 in the marketed value of the Quebec production, \$132,001 is to be credited to the sea fisheries and \$128,163 to the inland fisheries. On the sea fisheries side the catch of haddock more than doubled while the lobster catch increased by some 184,000 pounds. The cod catch was also heavier than in 1927, and there were increases in one or two other instances. Catches of herring and smelt both showed a falling off and the landings of mackerel were only a third as heavy as in 1927. In the inland fisheries there were increases both in catch and marketed value in the case of all save one or two of the commercial fisheries. The largest single increase was in the production of eels and the marketed value of this catch rose from \$110,778 in 1927 to \$189,905.

ONTARIO

The increases of \$360,524 in the marketed value of the Ontario production was chiefly due to larger returns from the pickerel and perch fisheries. The

catch of pickerel was less than in 1927 and the marketed value of the fish was \$420,252 as compared with \$300,529, while perch value was over three times the 1927 figure—\$704,025 as against \$211,352. Herring, trout, and whitefish fisheries were less successful than in the preceding year.

MANITOBA

In Manitoba there was a decrease in total catch but better market conditions resulted in an increase of \$200,576 in the value of the production. In the case of whitefish there was a slight increase in catch and a proportionately greater increase in marketed value. Tullibee catch dropped off over a million pounds but the marketed value of the catch was \$65,000 above the 1927 figure. Pickerel fishermen did better than in the preceding year both as regards catch and marketed value. A smaller quantity of pike was landed than in 1927 but yielded a larger sum on the market. Goldeye catch fell away slightly and the marketed value was only \$66 less than in 1927. Trout catch and value declined somewhat.

SASKATCHEWAN

Total catch in Saskatchewan was 413,100 pounds more than in 1927 and on the market value side there was an increase of approximately \$60,000. The whitefish production in the province, 4,366,700 pounds, was 234,400 pounds above the 1927 catch and was marketed for almost \$50,000 more. The pike and mullet catches increased, while there were decreases in the case of trout, pickerel, and tullibee. The catch of goldeyes was practically the same as in 1927.

ALBERTA

The greater production of trout in 1928 was chiefly responsible for the increase in the market value of the total provincial catch of fish. Trout landings of nearly 2,000,000 pounds were not far short of being twice as large as the 1927 catch and their market value was \$222,312, as compared with \$126,955 in the previous year. There were gains of various size in the catches of perch, pickerel, and tullibee, respectively, but decreases in the case of mullets, pike, and whitefish. The whitefish catch was 533,500 pounds under the 1927 total.

BRITISH COLUMBIA

A very large increase in the salmon catch and large increases in the catch of halibut and the catch of pilchards were features of the year in the British Columbia fisheries, and contributed the major part toward the rise of nearly \$3,700,000 in the marketed value of the provincial production. Only in the war year 1918 and in 1926 did the British Columbia fisheries have greater value than in 1928. The salmon catch for the year was 225,745,500 pounds, or about 76,700,000 pounds more than the 1927 catch, and it had a marketed value of \$17,245,670, as compared with \$14,253,803 in the previous year. The landing of halibut at British Columbia ports during the year exceeded the 1927 landings by about 3,146,600 pounds, but the marketed value in 1928 showed a drop of about \$97,000. The pilchard catch increased by 24,167,000 pounds. The herring catch was somewhat below the 1927 catch but the marketed value slightly greater.

YUKON TERRITORY

A remarkable increase took place in the value of the fisheries of the territory during the year, the marketed value of the catch reaching \$51,665, which was \$39,575 greater than in 1927. Increase in the salmon value to \$17,320, as compared with \$8,050 in the year before, was recorded, a \$13,000 increase in trout value, and an increase of almost \$12,000 in the case of whitefish.

ATLANTIC COAST FISHERIES

In the Atlantic coast fisheries 521,971,600 pounds of sea fish were landed during 1928, the catch by provinces being as follows:—

Nova Scotia.....	269,589,500 pounds
New Brunswick.....	149,559,400 "
Prince Edward Island.....	20,476,300 "
Quebec.....	82,346,400 "

The total marketed value of the sea fisheries production of the four provinces were \$20,106,495.

Cod, Haddock, Hake and Cusk, and Pollock.—Taken together, the catches of these five varieties of fish on the Atlantic coast made up a quantity very considerably above the 1927 total and their combined marketed value showed an increase of \$1,834,136. In 1928 the catch of these fish reached 294,822,100 pounds, with a marketed value of \$8,493,938, and in the year before the catch had been 261,274,300 pounds and its marketed value was \$6,659,802.

The production of smoked fish and smoked fillets from the 1928 catch of these fish was 11,132,700 pounds, or very slightly less than the production in the preceding year. The case was otherwise, however, as regards the production of fresh fish and fresh fillets and of dried and boneless fish from the catch in this group. The marketings of fresh fish and fresh fillets totalled 37,904,800 pounds, as against 33,417,500 pounds in 1927, and the production of dried fish and boneless fish was 57,468,200 pounds, as compared with 52,379,400 pounds in the earlier year.

The improved showing in regard to the catch and marketed value in the case of this group of fish was due to large gains in Nova Scotia and New Brunswick and a substantial gain in Quebec. In Prince Edward Island the 1927 catch of 6,191,300 pounds dropped to 4,977,300 pounds and marketed value from \$149,397 to \$125,444. So far as catch alone is concerned, Prince Edward Island showed a slight gain in the case of hake and cusk, a small decline in haddock landings, and a larger decrease in cod catch. Pollock are not taken by Prince Edward Island or Quebec fishermen.

Quebec's catch of cod was 46,992,400 pounds, or 815,200 pounds above the 1927 total. The provincial haddock catch of 588,400 pounds represented a gain of better than a hundred per cent. The hake and cusk catch increased nearly four-fold from 83,000 pounds in 1927 to 380,400 pounds in the year under review.

In New Brunswick there was a smaller haddock catch than in the year previous—2,887,800 pounds in 1928 as against 3,383,400 pounds—but there was distinct improvement in the cod fishery and the hake and cusk fishery. The cod landings for the year were 17,287,400 pounds, compared with 13,677,300 pounds in 1927, and landings of hake and cusk mounted to 7,872,600 pounds, an increase of over 3,200,000 pounds. The increase in pollock catch was relatively very large, 3,411,800 pounds being landed as compared with only 769,300 pounds in the year before.

Nova Scotia fishermen made larger catches of all these fish than in 1927. The cod catch was 147,017,200 pounds, as compared with 133,187,300 pounds, the haddock catch 44,595,000 pounds, as compared with 38,420,700 pounds, the catch of hake and cusk 15,874,400 pounds, as compared with 11,943,100 pounds, and the catch of pollock 3,057,300 pounds, as against 2,735,700 pounds.

Mackerel, Herring and Sardines.—Combined landings of herring, mackerel, and sardines were larger by 5,183,800 pounds than in 1927, but this was due to an increase of over 22,200,000 pounds in sardine catch for there was a 13,572,300 pounds decrease in herring landings, and mackerel catch was 3,502,900 pounds under the figures for the earlier year.

The smaller total for mackerel landings—12,376,800 pounds, as compared with 15,879,700 pounds—was due to the poorer success of the Quebec men engaged in this fishery. The Nova Scotia mackerel catch of 7,144,000 pounds was very little under the 1927 catch while the New Brunswick catch of 1,861,100 pounds more than doubled the landings for the previous year, and in Prince Edward Island the catch was 1,019,700 pounds, as compared with only 645,500 pounds in 1927. In Quebec the mackerel fishermen landed only 2,352,000 pounds, while in 1927 their catch had amounted to 7,076,500 pounds.

Herring catches were considerably below the 1927 figures in all four provinces. In New Brunswick the decrease was 7,700,000 pounds, in Nova Scotia 4,816,200 pounds, in Quebec 617,800 pounds, and in Prince Edward Island 438,300 pounds.

The year was a very successful one for the sardine fishery of New Brunswick and the catch was 55,869,800 pounds, as against 34,928,000 pounds in the year preceding. The increase in marketed value of the catch was \$238,521. The pack of sardines in the province was 257,881 cases. In 1927 the pack was 240,091 cases.

Other Sea Fish.—In 1928 the catch of halibut, which had been greater by 367,000 pounds on the Atlantic coast in 1927 than in the year previously, dropped 140,700 pounds below the 1927 total. The 1928 landings in Nova Scotia, New Brunswick and Quebec (the New Brunswick catch is small) totalled 2,710,300 pounds. Quebec's catch was 126,900 pounds, as compared with only 84,800 pounds in 1927, but the Nova Scotia catch decreased by some 178,300 pounds and there was also a decrease in the case of the New Brunswick catch. Swordfish, taken by Nova Scotia fishermen only, made up a catch of over 808,000 pounds, as compared with 729,900 pounds in the previous year. The catch of tomcods, which are taken chiefly in New Brunswick, fell to 1,960,100 pounds, or some 314,000 pounds less than in 1927. There was a large decrease also in the landings of flounders in Nova Scotia and New Brunswick, the total catch standing at 347,400 pounds, as against 938,300 pounds in the year before. The Nova Scotia flounder catch, which had been 819,500 pounds in 1927, was only 248,800 pounds in the year under review.

Lobsters.—In the four Atlantic provinces, together, the lobster catch increased by more than 500,000 pounds, reaching a total of 32,243,700 pounds. Prices, however, were not so good as in 1927 and the marketed value of the catch, \$5,053,699, was some \$372,000 under the figure for the previous year. The following tables show the catch, by provinces, for 1928 and 1927, the forms in which the catch was marketed in each year, and the marketed values; it may be noted that in 1928 the percentage of the catch shipped in shell was slightly greater than in 1927:—

CATCH

	1928		1927	
	Cwt.	Marketed value \$	Cwt.	Marketed value \$
Nova Scotia.....	172,409	3,048,255	179,673	3,255,627
New Brunswick.....	57,970	1,037,195	49,752	955,053
Prince Edward Island.....	65,613	752,123	62,800	855,917
Quebec.....	26,445	216,126	24,606	359,579
Totals.....	322,437	5,053,699	316,831	5,426,176

MARINE AND FISHERIES

QUANTITY SHIPPED IN SHELL

Nova Scotia.....	66,239	1,525,674	67,651	1,492,350
New Brunswick.....	24,384	583,833	16,162	431,870
Prince Edward Island.....	6,791	99,137	1,847	40,817
Quebec.....	492	6,708	1,147	14,022
Totals.....	97,906	2,215,352	86,907	1,979,059

QUANTITY CANNED

	Cases	Marketed value	Cases	Marketed value
		\$		\$
Nova Scotia.....	55,277	1,465,239	55,771	1,727,105
New Brunswick.....	19,468	451,165	18,866	522,162
Prince Edward Island.....	25,077	635,427	27,896	801,542
Quebec.....	12,164	332,091	11,404	342,289
Totals.....	111,986	2,883,922	113,937	3,393,098

TOMALLEY

Nova Scotia.....	3,226	38,322	2,536	31,838
New Brunswick.....	197	2,197	103	1,021
Prince Edward Island.....	799	10,759	630	9,558
Quebec.....	645	7,616	280	3,028
Totals.....	4,867	58,894	3,549	45,445

Other Shellfish.—The production of clams and quahaugs increased in all four of the provinces, save New Brunswick, and totalled 46,486 barrels, or a gain of 3,193 barrels. The greatest production is in New Brunswick, which accounted for 30,058 barrels. Scallop production, 12,331 barrels less than in 1927, was 26,304 barrels. The oyster catch showed a slight decrease in Nova Scotia, New Brunswick, and Prince Edward Island, taken together, for while the Nova Scotia catch and the Prince Edward Island catch, at 1,944 barrels and 4,756 barrels, respectively, were larger than the 1927 figures, the New Brunswick catch of 12,383 barrels was 1,191 barrels less than the year before.

River Spawning Fish.—There was a large decrease, taking the catch in the four provinces as a whole, in the landings of river spawning fish—alewives, salmon and smelt—although the smelt figures were larger than for the preceding year. The catch of alewives in Nova Scotia dropped from 1,468,000 pounds to 1,195,400 pounds, and in New Brunswick from 3,943,400 pounds to 2,361,000 pounds. In Prince Edward Island, where no alewives were reported as landed in 1927, there was a small catch of 15,000 pounds in 1928. Market conditions in the alewives trade, chiefly a trade in the salted fish, continued unsatisfactory, as in the previous year. The total decrease in the salmon catch was 2,239,800 pounds, the combined landings in the four provinces amounting to only 2,671,500 pounds, as against 4,911,300 pounds in 1927. There was a decrease in the catch in each of the four provinces. In the smelt fishery, New Brunswick, the chief producer, showed an increase of 1,368,200 pounds, the total landings in the province being 5,986,600 pounds, but the other three provinces all showed decreases.

INLAND FISHERIES GENERALLY

The inland fisheries are prosecuted in New Brunswick, where they are relatively unimportant as compared with the sea fisheries, and in Quebec, Ontario, the Prairie Provinces, and the Yukon Territory. Compared with 1927, the

year under review brought a gain in inland production value of slightly more than \$800,000, the figures covering marketed value for the two years standing at \$7,575,912 (1927) and \$8,381,751 (1928). The catches of the principal varieties of fish taken in inland waters in 1928 and 1927 were as follows:—

	1928	1927
	lbs.	lbs.
Whitefish.....	18,069,500	18,566,400
Pickereel or dore.....	14,261,000	14,001,900
Tullibee.....	10,414,500	12,176,400
Trout.....	9,007,500	8,990,400
Pike.....	6,270,100	7,047,300
Herring.....	5,999,300	6,320,100
Perch.....	5,175,100	3,318,900
Pels.....	2,324,000	1,455,200
Pickereel, blue.....	2,149,600	3,117,300
Mullets.....	1,606,500	1,590,600
Carp.....	1,349,700	1,275,800
Goldeyes.....	1,071,300	1,148,500

There were increases in the respective catches of bass, catfish, salmon, saugers, shad, sturgeon, and mixed fish. Alewives catch, maskinonge catch, and the catch of smelt were under the 1927 figures.

The largest catch of whitefish was in Ontario, 5,823,500 pounds, but this total was smaller by some 342,000 pounds than the 1927 catch. The catches in Manitoba and Saskatchewan, respectively, were somewhat larger than in 1927, but Alberta landings fell off. Quebec showed some gain.

Manitoba, the principal pickerel producer, had a larger catch than in 1927 and 10,187,000 pounds were landed, as against 9,981,300 pounds in the previous year. Ontario's catch of 2,001,200 pounds was not quite as large as the 1927 total. Saskatchewan's catch, 305,400 pounds, was slightly less than the catch for the year before, but Alberta, with 849,900 pounds to its credit, did better by over 175,000 pounds than in the previous year.

All the blue pickerel landed were taken in Ontario. The catch in 1928, as will be noted from the foregoing table, showed a decrease, but marketed value an increase.

Manitoba continued the chief producer of pike but its catch was about 380,000 pounds less than in 1927 when 4,016,600 pounds were brought ashore. There were larger catches in Quebec and Saskatchewan than in 1927 but smaller catches in Ontario and Alberta.

THE PRAIRIE PROVINCE FISHERY

On the whole, conditions in the fishing industry in the Prairie Provinces were better in 1928 than they had been in 1927, notwithstanding that unfavourable weather interfered with the winter fishing. In Manitoba, for instance, while commercial production showed a decrease, there was an increase in the marketed value of the catch. In Saskatchewan there was an increase of over 400,000 pounds in the commercial production. The winter fishery in Alberta showed a considerable drop in catch but the summer fishery a much greater increase so that there was a net gain of more than 450,000 pounds, and prices, taken as a whole, were satisfactory; summer fishery prices ran from fair to average and winter prices were good. There was an increase in the number of men engaged in the industry in the three provinces, and it is noteworthy that the trend was distinctly toward expansion, as indicated by increased equipment. In Saskatchewan the equipment in use was valued at \$26,660 more than in 1927, the number of gill-nets, for instance, increasing by 2,926. In Alberta the value of equipment advanced to \$416,185. Manitoba fishermen, unfortunately, met with heavy loss in equipment during the year as a result of adverse weather conditions; in several cases gangs lost their entire outfits and it is estimated that the total loss in nets reached \$42,600.

Increased angling featured the year in all three provinces. In Alberta the number of angling permits reached a new high level. The amount of fish taken by anglers in Alberta in 1928 was almost twice as great as in the preceding year. Anglers in Saskatchewan numbered more than in 1927 but their total catch was smaller. In Manitoba, where the number of anglers reached 6,113 and the total catch was estimated at 293,500 pounds, an outstanding feature was that the number of non-residents taking out licenses was more than double the 1927 total, reaching 1,113.

Improvement in angling in the Prairie Provinces was the result, in large part, of the action of the department in stocking various waters with trout and other fish in recent years. Good catches were reported in streams which had previously been stocked with trout. Thousands of perch were taken from Mayatan lake, Alberta, where, in 1922, the department placed only forty-two adult fish. Great numbers of young perch were to be seen in other Alberta lakes which were stocked with adult perch as recently as 1925, while perch fingerlings which were placed in Whitewood lake in that year had grown by 1928 to more than half a pound in weight. Similar results were seen in 1928 from the placing of pickerel in other waters. In Saskatchewan a number of waters which had been stocked some years ago afforded good angling, and, generally, in all three provinces the results of this policy of stocking waters from the Government hatcheries have been satisfactory, leading to better angling year by year.

Further development of the fishery in lake Athabaska, in the extreme north of the Prairie Provinces, was a noteworthy advance of 1928, indicative of the possibilities of the future in the Dominion's northern areas. The fish taken from lake Athabaska are being marketed in increasing quantities as the fishery is developed by energetic and progressive methods. During 1928 improved equipment was put in operation in the Athabaska fishery with resultant improvement in the attractiveness of the product sent to market. Trout carefully sliced by machinery, frozen, and packed in attractively-branded wax paper were sent to distant urban markets with satisfactory result. Addition of two new steam tugs and two refrigerator barges to the fishing equipment evidenced the expansion of the fishery on the lake.

Establishment of a co-operative "Fish Pool" in Manitoba was an important step in the Prairie Province fishery during 1928. Establishment of the pool, which is known officially as the Manitoba Co-operative Fisheries and is incorporated under the Manitoba Co-operative Societies Act, was the culmination of discussion which had been going on for several years among Manitoba fishermen and independent dealers. Organization was completed in the mid-summer of 1928 and up to January 28, 1929, the pool had handled 3,326,255 pounds of fresh and frozen fish from the winter production. At the end of last January the pool membership was 515 which was estimated to represent from 1,000 to 1,200 men out of a total of some 4,100 men engaged in the Manitoba fishery.

An interesting development in connection with the fishing industry in these provinces is the effect of mining progress and railway extension in making for the expansion of the fishery in some of the more remote waters already under operation and in opening up new waters. For example, the completion of the railway to the Flin-Flon mine in northern Manitoba has made it possible for fishermen operating in the area of the Churchill waters between Pelican narrows and Island falls, the centre of the main sturgeon fishery of the Churchill, to put their catch at rail-head in one day, with the shipments reaching The Pas on the following day, whereas, formerly, a twenty-day round trip with teams was necessary. Similarly, an extension of that railway northward from Cranberry portage to the location of the Sherritt-Gordon mining properties at Cold lake, which is now under way, will bring virtually all the waters along the western part of these northern areas of Manitoba within comparatively easy reach of

railway transportation. In Saskatchewan a railway survey line projecting from Nipawan has already established a trail for fishermen to Big Bear, Ballyntyne, and Deschambault lakes. This new railway will open up a number of important fishing lakes and with other proposed railways will bring valuable fisheries within a reasonable distance of rail transportation.

PACIFIC COAST FISHERIES

The major feature of the British Columbia fishery is export business in canned salmon, which, in 1928, was done with more than twenty-five different countries. The largest trade was with France, which took about 333,670 cases out of the total pack of 2,035,637 cases. Australasian purchases reached some 269,000 cases and the United Kingdom was third among the customers in point of quantity purchased, taking approximately 258,000 cases. Shipments to continental Europe, apart from those to France, amounted to almost 150,000 cases, with Belgian buying accounting for more than one-third of the quantity. Consignments to the Atlantic coast of the United States totalled slightly more than 14,500 cases. Exports to South Africa and West Africa made up a total of more than 63,000 cases, while other countries to which shipments were made included Central and South American states, Ceylon, China, the Dutch East Indies, Egypt, Fiji, India, Japan, the Philippines, the Straits Settlements, and the West Indies.

The drop in the sockeye production in 1928 to 203,541 cases—more than 100,000 cases below the average pack for the five-year period, 1924-25—prevented the record salmon pack of 1926 from being exceeded. As it was, however, the total pack was less than 30,000 cases under the 1926 figures. Both in pinks and chums the former records (1926) were broken in 1928. The pack of pinks was 792,362 cases, or 19,369 cases above the former record, and the pack of chums mounted to 161,294 cases above the old record and reached 863,256 cases. The 1928 pack of cohoes was 150,684 cases and the pack of springs 18,856 cases, but an increasing quantity both of springs and cohoes is being used each year in the fresh and frozen fish trade.

The runs of pinks and chums were exceptionally large, taking the province as a whole, and, at the same time fishery officers reported that in the course of the season they saw both these varieties of salmon in streams in which the fish had not been known to be seen before. The decline in the sockeye pack was chiefly due to the falling off in production of the Fraser and Skeena rivers. In both the two preceding years very late runs of sockeye helped to swell the total pack on the Fraser, but in 1928 there was no such late run. In the Skeena area the small pack was partly attributable to the establishment, during the sockeye season on these waters, of a weekly closed period of sixty hours—a step taken with a view to greater conservation, and taken, the evidence indicates, with excellent results. Operations in the Barclay sound area during the year indicated that the fish cultural program and restriction of fishing in this area in recent years have had beneficial effect, as evidenced by an excellent run of sockeye.

Improved standard of pack was noted during the year, and a continuance of this improvement should result in an increasing and more satisfactory market. The improvement in standard is regarded as traceable, in large part, to two causes. First, there was the reduction in the number of purse seines in use, a reduction flowing from the action of the department in influencing those concerned to bring about an agreement to this effect. Following on this agreement, purse seine fishing was confined, for the most part, to waters within reasonable distance of the canneries supplied by the seines and the salmon thus were brought to the canning plants fresher and in better condition than would otherwise have been the case. The second factor making for the improvement

in the standard of the pack was the enactment of regulations requiring that fish that were to be transported over open water areas, where delays in navigation were liable to occur, must be gutted and packed in ice immediately after being caught.

Two other developments of interest and importance in the Pacific coast fishery during 1928 were the increase in the production of dry-salted herring and the increase in the production of fish meal and oil. Practically all of the yearly production of dry-salted herring is exported to China, and in 1928 the output reached a new high level—107,218,800 pounds—though disturbed Chinese conditions brought some difficulties to the marketing problem. The production last year was 2,399,800 pounds greater than the output in 1927.

In 1928 the fish oil manufactured in British Columbia totalled 5,047,338 gallons, as compared with 3,657,627 gallons in 1927. The production of fish meal and fertilizer (including also some whalebone) was 20,119 tons, as against 17,655 tons in the year previous. The great increase was in the production from pilchards, oil manufacture rising from 2,673,876 gallons to 3,995,806 gallons and the production of meal and fertilizer increasing to 14,500 tons, as compared with 12,169 tons in 1927. Canning of pilchards also reached high figures during 1928, when 65,097 cases were produced, the largest total for any year since 1920.

Some increase in the proportion of Canadian landings at Prince Rupert was apparent in the halibut fishery in 1928, although the quantity of fish landed at that port by American vessels was still much greater than the catch brought ashore there by Canadian schooners. The total quantity of halibut landed at British Columbia ports during the year was 30,282,000 pounds. This was more than 3,146,000 pounds greater than the total of the 1927 landings but was below the average for the 1923-26 period.

A large increase in the number of fur seals taken off the British Columbia coast by Indians was shown in 1928, and there was also an increase in the catch of whales. The Indians, who have the right under the Pelagic Sealing Treaty to take seals, landed 2,090 skins, as compared with only 1,476 in 1927. The catch of whales made by six steamers operating from the two stations maintained during the year was 305, as against 258 in 1927 and 269 in 1926.

Continuing the departmental program of endeavouring to improve the sport fishery of the province, 201 plantings of eggs and fry were made in the course of 1928 and careful inspection of lakes and streams was carried on by the fishery officers. Useful results are believed to be flowing from these activities.

INSPECTION OF FISH

Under authority of the Fish Inspection Act, inspection of certain kinds of fish and the packages in which they are marketed was carried on during the season of 1928-29. The provisions of the Act apply to salted herring, mackerel, alewives, salmon, and smoked round herring.

Under the authority of the Act and regulations, standards of size and quality have been established for dried and boneless cod and such like fish, and provision has been made for the inspection of such fish, in the event of a seller and buyer deciding to make a contract on the basis of the established standards.

The chief purposes of the Act are to require that all fish which come under its provisions shall be well cured and in accordance with the standards laid down in the regulations; that such fish shall be packed in barrels or other packages of a standard size and type; that the barrels and other packages shall contain the proper weight of fish, and that the fish contained therein shall be as the marks on the package represent them to be.

A few years ago it was a rather difficult matter to persuade fishermen and packers generally that submitting their fish to the provisions of the Fish Inspection Act would result in benefit to them. A judicious and tactful administration of the Act, however, has secured the goodwill and co-operation of the trade to such a degree that most buyers of both barrels and fish insist on an official inspection being part of the contract.

On the Atlantic coast during the year under review 28,281 barrels of various kinds containing cured fish were inspected; 77,055 boxes of smoked herring were also inspected before being shipped. Furthermore 39,902 empty barrels were inspected before being taken over by dealers and packers for the packing and marketing of pickled fish.

On the Pacific coast 269,070 boxes of dry salted herring, each containing four hundred pounds, were inspected before shipment to the Orient.

INSPECTION OF CANNERIES AND CANNED FOOD

The inspection of fish canneries of all kinds throughout Canada, the raw material to be used therein, the whole process of canning, the canned products and the labelling and marking of the cans, was carried on during the year under the provisions of the Meat and Canned Foods Act. This inspection is conducted by the department's staff of fishery overseers as part of their regular duties. It has for its object

- (1) the extension of trade by improving the quality of the product, and
- (2) the protection of the public by preventing the packing of unsound fish and insisting on the correct labelling of cans of fish.

On the Atlantic coast there are operated 378 lobster canneries, 28 clam canneries and 36 other fish canneries in which there are canned sardines, salmon, haddock, cod, mackerel and crabs.

On the Pacific coast there are operated 86 salmon canneries, in some of which clams and pilchards are also canned.

A number of the canneries on the Atlantic coast are small and operated by individuals who have very little capital at their disposal, and the task of bringing such canneries into line with all the requirements of the Act and the regulations has not been a very easy one. A very marked improvement has been secured, however, in recent years, not only in the conditions under which operations are carried on from a sanitary point of view, but in the quality of the canned product. Defects in buildings and equipment are being continually noted and corrected at the instigation of the inspecting officers.

MARINE BIOLOGICAL BOARD

The Marine Biological Board, which operates under the control of the minister, was created in 1912 by an Act of Parliament. For ten years the membership of the board consisted entirely of scientists, two of which were nominated by the minister, and the others by universities in which biological research was being carried on. In 1923 the Act was amended with a view to bringing the board into closer contact with the department and the practical problems of the fishing industry. Under the amended Act the board now consists partly of scientific men, partly of departmental officers, and partly of men from the industry.

With this new organization, there is in operation on both coasts a station at which purely scientific researches are carried on, and another at which the results of previous and current scientific researches are applied to the everyday economic problems of those engaged in the industry, which latter are known as Fisheries Experimental Stations. These are designed to do all for the Fisheries that Experimental Farms can do for agriculture.

The Atlantic stations are located at St. Andrews, New Brunswick, and Halifax, Nova Scotia, and the Pacific ones at Nanaimo, B.C., and Prince Rupert, B.C., respectively.

In addition to conducting the ordinary work of the stations, the board undertook to continue giving the six weeks' course of instruction to fishermen at the Halifax Station. Arrangements also were made to give a six weeks' course of instruction to fishery officers in order to determine which of them would be capable of undertaking advanced work, and to equip them to undertake the duties connected with the inspection of fish and instruction to fishermen.

Furthermore, it has built and equipped a marine laboratory at the mouth of Halifax harbour for the training of students at Dalhousie or any other university, who desire to take a course in fisheries science with a view to securing a B.Sc. "Fisheries" degree.

The board has further provided itself with a fully qualified staff at the Fisheries Experimental Station at Halifax to co-operate in the university courses.

The composition of the board and its various committees during the year was as follows:—

Prof. J. P. McMurrich, University of Toronto, chairman.
 J. J. Cowie, Esq., Department of Marine and Fisheries, secretary-treasurer.
 Prof. A. T. Cameron, University of Manitoba.
 Prof. C. J. Connolly, St. Francis Xavier University.
 Prof. P. Cox, University of New Brunswick.
 John Dybhavn, Esq., Prince Rupert.
 Prof. J. N. Gowanloch, Dalhousie University.
 Very Rev. Canon V. A. Huard, Laval University.
 Prof. A. T. Hutchinson, University of British Columbia.
 Prof. W. T. MacClement, Queen's University.
 Prof. Marie-Victorin, University of Montreal.
 Prof. E. E. Prince, Ottawa.
 J. A. Rodd, Esq., Department of Marine and Fisheries.
 Prof. W. P. Thompson, University of Saskatchewan.
 A. H. Whitman, Esq., Halifax.
 Prof. A. Willey, McGill University.

The members of the board receive no pay, but are allowed travelling expenses in connection with the board's work and its meetings.

The Central Executive Committee consisted of:—

Prof. J. P. McMurrich
 Prof. W. T. MacClement
 J. J. Cowie
 Prof. E. E. Prince
 Prof. A. Willey
 Prof. Marie-Victorin

The Atlantic Sub-Executive Committee consisted of:—

A. Handfield Whitman, chairman
 Prof. J. N. Gowanloch
 Prof. C. J. Connolly

The Pacific Sub-Executive Committee consisted of:—

John Dybhavn, chairman
 Prof. A. T. Hutchinson
 Prof. A. T. Cameron

The Research Committee on Fish Culture consisted of:—

Dr. A. G. Huntsman, chairman

Dr. W. A. Clemens

Dr. A. H. Leim

Prof. A. T. Cameron

Mr. J. A. Rodd

Dr. R. E. Foerster, secretary.

A detailed report on the work of the board's staff during the year will be found as Appendix No. 2 of this publication.

FISHERIES INTELLIGENCE SERVICE

Radio distribution of weather, bait, and ice reports was an important additional step in the Fisheries Intelligence Service in 1928. Throughout the year weather reports were broadcast twice daily from Halifax, Louisburg, and Saint John, and, from April 24 to November 30 broadcasts of reports as to bait and ice supplies from upwards of twenty points, ice conditions along the coast, and prevailing local prices for dried and slack-salted fish were sent out twice a day from Halifax and Louisburg. Included in these latter broadcasts from time to time were items of current news and important messages for fishermen at sea. The various broadcasts cover the Grand Banks and other fishing grounds and as most of the vessels engaged in the fishing industry are now equipped with wireless receiving sets the service was of very considerable value.

Collection of monthly statistics covering the sea fisheries, and their distribution in summarized form through the press and by other means, and the publication of a quarterly bulletin giving the statistics in detail, were continued during 1928. Practically all of the statistics are collected by the fishery officers as part of their regular duty, and compilation and distribution are looked after at Ottawa. The daily collection of information as to supplies of bait along certain sections of the coast was also carried on during the spring and summer months. The facts necessary to the operation of this part of the intelligence service are obtained by fisheries officers and are sent by telegram, daily, to a number of ports where they are posted up for the information of masters of fishing vessels and others who may be seeking bait.

In accordance with a recommendation made by the Royal Commission on the Fisheries of the Maritime Provinces and the Magdalen Islands steps were taken during the year toward the establishment of a Fisheries Intelligence and Publicity Division within the department. Shortly before the end of the fiscal year the appointment of a Director of Fisheries Intelligence and Publicity was made by the Civil Service Commission. Plans for expanding and improving the collection and distribution of statistical, market, and other information in connection with the fisheries are now being proceeded with by the new division.

FISHING BOUNTY

Under the authority of "An Act to Encourage the Development of the Sea Fisheries and the Building of Fishing Vessels", the sum of \$160,000 is appropriated annually by the Governor in Council. It is distributed under the name of Fishing Bounty by the Department of Marine and Fisheries amongst fishermen and fishing vessel and boat owners on the Atlantic coast, under regulations made from time to time by the Governor in Council.

For the year 1928, payment was made on the following basis:—

To owners of vessels entitled to receive bounty, \$1 per registered ton, payment to the owner of any one vessel not to exceed \$80.

To vessel fishermen entitled to receive bounty, \$7.50 each.

To owners of boats measuring not less than 12 feet keel, \$1 per boat.

To boat fishermen entitled to receive bounty, \$6.50 each.

There were 9,390 bounty claims paid. In the preceding year there were 9,609 bounty claims paid.

The total amount paid was \$151,411.20, allocated as follows:—

To 553 vessels and their crews	\$ 41,099 50
To 8,837 boats and their crews	110,311 70

BOUNTY EXPENDITURE FOR 1928-29

County	Boats	Men	Amount	Vessels	Tons	Avg. Tons	Men	Amount	Total Amount
<i>Nova Scotia</i>			\$ cts.					\$ cts.	\$ cts.
Annapolis.....	142	256	1,806 00	1	15	15	5	52 50	1,858 50
Antigonish.....	115	167	1,200 50						1,200 50
Cape Breton.....	281	506	3,554 20	33	524	16	137	1,551 50	5,105 70
Cumberland.....	3	4	29 00						29 00
Digby.....	300	504	3,576 00						3,576 00
Guysboro.....	512	847	6,017 50	29	513	18	148	1,623 00	7,640 50
Halifax.....	831	1,080	7,851 60	72	1,105	15	272	3,145 50	10,996 60
Inverness.....	246	519	3,619 90	6	68	11	27	270 50	3,890 40
Kings.....	31	45	323 50						323 50
Lunenburg.....	406	501	3,662 50	128	6,868	54	1,706	19,663 00	23,325 50
Pictou.....	20	30	215 00						215 00
Quebec.....	111	188	1,333 00	17	266	16	71	798 50	2,131 50
Richmond.....	337	605	4,269 70	8	124	16	32	364 00	4,633 70
Shelburne.....	450	822	5,793 20	26	555	21	179	1,897 50	7,690 70
Victoria.....	270	426	3,039 00	10	135	13	37	412 50	3,451 50
Yarmouth.....	118	251	1,749 50	12	472	39	105	1,259 50	3,009 00
Total.....	4,173	6,751	48,040 10	342	10,645	31	2,719	31,037 50	79,077 60
<i>New Brunswick</i>									
Charlotte.....	266	451	3,191 70	2	22	11	5	59 50	3,251 20
Gloucester.....	295	727	5,021 60	191	3,154	16	828	9,365 50	14,387 10
Kent.....	90	160	1,130 00	6	63	10	11	145 50	1,275 50
Northumberland..	5	7	50 50	3	38	12	10	113 00	163 50
Restigouche.....	2	4	28 00	1	10	10	3	32 50	60 50
Saint John.....	29	34	250 00						250 00
Total.....	687	1,383	9,671 80	203	3,287	16	857	9,716 00	19,387 80
<i>Prince Edward Island</i>									
Kings.....	202	284	2,047 40	1	10	10	2	25 00	2,072 40
Prince.....	461	774	5,494 70	2	23	11	5	60 50	5,555 20
Queens.....	120	244	1,706 70						1,706 70
Total.....	783	1,302	9,248 80	3	33	11	7	85 50	9,334 30
<i>Quebec</i>									
Bonaventure.....	545	966	6,821 20	1	11	11	3	33 50	6,854 70
Gaspé.....	2,246	4,502	31,426 30	4	62	15	22	227 00	31,653 30
Matane.....	58	73	533 00						533 00
Saguenay.....	345	648	4,570 50						4,570 50
Total.....	3,194	6,189	43,351 00	5	73	14	25	260 50	43,611 50
Grand Total.....	8,837	15,625	110,311 70	553	14,038	25	3,608	41,099 50	151,411 20

FISH COLLECTION SERVICES

Expansion of fish collection service was carried out on the Atlantic coast during 1928 with satisfactory results. In some cases, it has been testified by fishermen, the operation of fish collection boats "turned what had every appearance of a failure in the fisheries to a successful year for our fishermen." Under the collection plan, boats chartered by the department ply along specified routes, where buyers undertake to purchase the catches of the fishermen, collect the fish purchased at the various places and deliver them at such central points as may be agreed upon. A charge of ten cents a hundredweight is made for collecting and delivering the fish.

The first collection service was established in 1927 on the coast between Port Bickerton and Canso, Nova Scotia. The usefulness of such services as factors in promoting fisheries expansion is indicated by the fact that the quantity of cod and haddock carried by the Port Bickerton-Canso collection boats during 1928, a total of 3,213,056 pounds, was greater by slightly more than 1,000,000 pounds than the quantity carried in 1927. All told, four collection services were operated during 1928, though the new services could not be put regularly in operation until after the fishing season had been in progress for some time. The four services carried on during the year were as follows: Eastern Cape Breton-Canso; Port Bickerton-Canso; Sonora-Halifax; and a service on the Shelburne county shore. Together they served over thirty fishing ports and the total quantity of fish of all kinds which was carried for the fishermen was 5,311,481 pounds, these figures including some collections made during the first ten days of 1929. The services have proved of much benefit in enabling the fishermen to sell their catches promptly and for cash and in making it possible for them to devote to the actual work of fishing the time which, previously, they were often compelled to employ in preparing their fish for the dried and cured fish markets.

FISH CULTURE

The fish cultural operations of the Fisheries Branch during the calendar year 1928 were devoted almost entirely to the propagation of the more important fresh water and anadromous food and game fishes, such as Atlantic salmon and speckled trout in the Maritime Provinces, whitefish, pickerel and game trout in the Prairie Provinces, and Pacific salmon and game trout in British Columbia, but in response to an annually increasing public demand, greater attention was paid to the propagation of game trout. Increased facilities for retaining and feeding fry so as to afford a longer season for distribution were provided at several establishments where such development was feasible. The total distribution for 1928 was over 59 per cent larger than it was during the preceding year, being increased from 295,283,782 to 470,302,380, an increase of 175,018,598.

In addition to the distributions that were made from the hatcheries, twenty-six lakes and streams received allotments of fry or older fish from other bodies of water. This work was largely confined to the Prairie Provinces where there are many districts which are not readily accessible to existing hatcheries. It involved the capture and transfer, in many instances for considerable distances, of 44,932 fish, comprising seven different species.

The seeding of remote and isolated waters (to which it is not feasible to transfer fry from existing hatcheries) with eyed eggs was continued in British Columbia, and 13,013,000 sockeye salmon eggs collected in the Pemberton district below Hell's Gate on the Fraser were planted in the one time spawning beds of such important areas as Stuart, Francois and Quesnel lakes in the Upper Fraser above Hell's Gate.

Examinations and inspections were continued in the different provinces with a view to locating waters where fish eggs might be obtained in sufficient quantities for hatchery purposes and with a view to locating sites where the fish cultural service might be advantageously extended by the construction of new establishments in districts that are not readily accessible from existing hatcheries.

As opportunity offered the general inspection of waters throughout the country was continued by officers and employees of the fish cultural and fishery services.

The Canadian National Railway, Canadian Pacific Railway, Dominion Atlantic Railway, Pacific Great Eastern Railway, Esquimalt and Nanaimo Railway, Kettle Valley Railway, and the Cumberland Railway and Coal Company continued their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants.

The extent of this co-operation is indicated in the following statement:—

Railway	Total mileage on trip passes	Number of passages	Mileage Baggage car permit			Number cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	19,222	180	10,555	13,127	23,682	876	869	1,745	181
C.P.R.....	17,524	118	9,516	10,363	19,879	559	564	1,123	136
D.A.R.....	2,366	31	1,407	1,407	2,814	123	123	246	37
E. & N. R.....	672	12	343	343	686	41	41	82	12
K.V.R.....	296	1	296	.....	296	3	.....	3	1
P.G.E.R.....	178	4	89	89	178	6	6	12	4
	40,258	346	22,206	25,329	47,535	1,608	1,603	3,211	371

NOTE.—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one way passage for cases or cans, either by permit, special authority or free transportation without a permit form.

The branch participated with assortments of hatchery products in several exhibits for portraying natural resources. These exhibits were of considerable educational value and aroused great interest.

Gratifying reports regarding the results that are apparent from the distribution of hatchery products continue to accumulate from all districts where fish cultural operations are carried on.

Considerable expansion was made in the provinces in which the fisheries are administered by the Dominion Government. Large salmon and trout hatcheries were constructed in Antigonish and Yarmouth counties, Nova Scotia. The pond facilities for fry and brood fish were improved and slightly extended at several hatcheries in the Maritime Provinces. A pickerel hatchery was constructed on Swan creek, lake Manitoba. A large whitefish and pickerel hatchery was constructed on Lesser Slave lake and a trout hatchery in Waterton Lakes park, Alberta. A detailed description of the new construction and the more important repairs appears in the report of the Fisheries Engineer.

At the close of 1928 the Fisheries Branch had the following fully equipped establishments, all of which, with the exception of the newly constructed pickerel hatchery on lake Manitoba, had been in operation that year, viz: thirty main hatcheries, ten subsidiary hatcheries, four salmon retaining ponds, and several egg collecting stations. The output from these establishments for the calendar year 1928 was 470,302,380 as shown by species in the following statement:—

STATEMENT, BY SPECIES, OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1928

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger-lings	Yearlings and older fish	Total distribution
<i>Salmo salar</i> —Atlantic salmon	300	104,070	3,832,725	4,473,300	11,346,337		19,756,732
<i>Salmo salar sebago</i> —Landlocked salmon				98,230		78	98,308
<i>Salmo irideus</i> —Rainbow trout		175,500	321,127		399,346	3,954	899,927
<i>Salmo clarkii</i> —Cutthroat trout			1,731,591		2,212	9	1,733,812
<i>Salmo gairdneri</i> —Steelhead salmon		12,083	164,760				176,843
<i>Salmo gairdneri kamloops</i> —Kamloops trout		1,117,975	1,036,661		3,656		2,158,292
<i>Salmo trutta lewini</i> —Loch leven trout				46,096	483,398	9,419	538,913
<i>Salmo gairdneri</i> —Brown trout					472,143	4,760	476,903
<i>Oncorhynchus nerka</i> —Sockeye salmon		33,041,965	50,359,788	550,000	4,687,237	1,992	88,640,982
<i>Oncorhynchus tshawytscha</i> —Spring salmon		544,000	313,500		218,077		1,075,577
<i>Oncorhynchus kisutch</i> —Kennerly's salmon			205,000				205,000
<i>Oncorhynchus kisutch</i> —Coho salmon		499,380					499,380
<i>Salvelinus fontinalis</i> —Speckled trout		276,400	654,268	546,000	3,079,834	5,171	4,561,673
<i>Coregonus clupeaformis</i> —Whitefish	3,225,000	100,000	125,858,026				129,183,026
<i>Cristivomer namaycush</i> —Salmon trout					12		12
<i>Stizostedion vitreum</i> —Pickerel	187,680,000		32,617,000				220,297,000
	190,905,300	35,871,373	217,094,446	5,713,626	20,692,252	25,383	470,302,380

The following statement shows the numbers of fry of the different kinds distributed in the several provinces in which fish cultural operations are conducted by the Dominion Government:—

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH DURING 1928

Nova Scotia—			
Atlantic salmon	6,292,421		
Speckled trout	1,382,345		
		7,674,766	
New Brunswick—			
Atlantic salmon	11,955,588		
Brown trout	308,889		
Landlocked salmon	98,308		
Loch leven trout	64,213		
Rainbow trout	4,874		
Speckled trout	2,073,296		
		14,505,168	
Prince Edward Island—			
Atlantic salmon	618,653		
Rainbow trout	11,409		
Speckled trout	413,355		
		1,043,417	
Manitoba—			
Pickerel	200,727,000		
Whitefish	109,204,026		
		309,931,026	
Saskatchewan—			
Brown trout	38,000		
Pickerel	19,570,000		
Whitefish	15,199,000		
		34,807,000	
Alberta—			
Brown trout	130,014		
Cutthroat trout	1,512,483		
Loch leven trout	474,700		
Rainbow trout	565,502		
Salmon trout	12		
Speckled trout	190,774		
		2,873,485	

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH DURING 1928—*Concluded*

British Columbia—	
Atlantic salmon.....	890,070
Coho salmon.....	499,380
Cutthroat trout.....	221,329
Kamloops trout.....	2,158,292
Kennerly's salmon.....	205,000
Rainbow trout.....	318,142
Sockeye salmon.....	88,640,982
Speckled trout.....	501,903
Spring salmon.....	1,075,577
Steelhead salmon.....	176,843
Whitefish.....	4,780,000
Total.....	99,467,518 470,302,380

Full particulars regarding the extent and scope of this service appear in the Annual Report on Fish Culture for 1928, which appears as Appendix No. 3 herewith. Copies of the report on Fish Culture may be obtained on application to the Fisheries Branch.

OYSTER DEVELOPMENT, PRINCE EDWARD ISLAND

On April 3 last an agreement entered into with the Premier of Prince Edward Island to enable the Fisheries Branch to encourage the development of oyster and other mollusk production was approved by the Lieutenant-Governor in Council. Under this agreement the divided jurisdiction in connection with the oyster industry that had existed since the Privy Council decision of 1898 was ended by placing in the hands of this branch complete control. The branch, on the other hand, undertakes to carry out investigations with a view to ascertaining the best methods of developing the industry and to take such measures towards that end as it may deem proper and advisable.

The possibilities of the oyster industry in Prince Edward Island, and in New Brunswick and Nova Scotia as well, are vastly greater than is generally realized. The Fisheries Branch is satisfied that by the application of proper methods the oyster industry of Prince Edward Island can be made more valuable than are the whole fisheries of that province at the present time. No great oyster industry, however, can be built up and maintained by relying on public beds alone. Experience in all countries that have important oyster fisheries bears this out. It is also a fact that extensive oyster farming tends to improve the fishing on adjacent public beds by the increased amount of spat that is likely to find its way to them. Relying on public beds alone is obviously wrong in principle as it involves attempting to save a fishery by restriction rather than by wise use and expansion, which are the result of intelligent oyster farming.

Richmond bay, which was at one time by far the greatest oyster producing area in Prince Edward Island, is now barren owing to an epidemic that broke out amongst the oysters there and ended only with their final destruction. Hence this area is now lying fallow and is entirely suitable for a large oyster farming industry. The branch, however, realizes that while oyster farming is entirely practicable and desirable there is much to learn regarding it in our areas, as conditions may be largely different from those prevailing in other countries where oyster farming is such an important industry. Consequently before active measures are taken to encourage private enterprise to go into the industry the branch decided that the best thing to do was for it to have a study made of the situation in connection with which demonstration oyster farms would be built up. To that end the services of an experienced and competent oyster farmer from Rhode Island were secured. He was given the necessary facilities to make a thorough examination of the local conditions in Richmond

bay and tributary waters and was instructed that when this was done he should select one or two areas which should be developed as oyster farms. Two areas were selected by him—one of approximately fifty acres near Curtain island in the bay itself, and the other of about ten acres off Gillis point in Grand river. Preparatory work was done on both areas, and in addition to procuring oysters of different sizes from other areas and laying them down for the winter on the Gillis point area to be transferred next spring to the Curtain island area, a successful effort in spat collection was made in Bideford river, where a small quantity of parent oysters still exist. The report of this officer, Mr. David R. Dodge, forms Appendix No. 5 to this report.

Arrangements have also been made with the Biological Board to secure the services of a properly trained man who will devote himself to a scientific study of the oyster. He will work in co-operation with the officer in charge of building up the demonstration farms. It is anticipated that in a very few years the department will have the necessary information to enable it to take such measures as may be necessary to encourage the building up of a large industry in oyster farming.

The yield of oysters on cultivated beds of course varies greatly according to the local conditions. In the state of Connecticut good areas have yielded over 2,000 bushels per acre in a year. This is exceedingly high, but yields of from 200 to 500 bushels per acre should reasonably be expected. What this means will be realized if the Malpeque bay situation alone is considered. That bay contains about 30,000 acres. Probably about 3,000 acres have in the past produced oysters. The late Dr. Julius Nelson, who was a distinguished oyster investigator, and who examined conditions there a number of years ago, stated that there was good possibility that a quarter of the bay could be made productive. He added: "We wish to emphasize the necessity of pushing the practice of raising oysters from the seed, by artificial culture, insistently, persistently, consistently, and intelligently and scientifically, as the only way to restore the bay to its original productiveness, or even to keep its beds from ultimate destruction. But if the practice of scientific oyster culture be encouraged and developed, there is no reason for doubting that the maximum production formerly exhibited by this bay, under nature, and by fishing methods, can be increased very much."

What is possible in Richmond bay is in more or less measure possible and probable in Bedeque bay and various other areas about the province. It is proposed to push forward investigations and the development of the demonstration oyster farms during the coming year to as great an extent as can feasibly be done.

SCALLOP AND OYSTER INVESTIGATIONS

In addition to the work in connection with the oyster resources of Prince Edward Island, further examination of the oyster beds at Wallace, N.S., and scallop resources at Mahone bay, N.S., Country and Isaac's harbours, N.S., and off Prince county, P.E.I., respectively, was carried on by the Fisheries Branch during the year. These investigations were made by Mr. Andrew Halkett, naturalist of the branch.

Mr. Halkett found that there are no scallop resources of importance at Country harbour or Isaac's harbour. At Mahone bay he found that there is steady improvement in the condition of the scallop. His investigations in the gulf of St. Lawrence, off Prince county, P.E.I., which augmented an exploration made in 1927, showed the best scallop beds to be in the waters between Alberton and cape Kildare, with scallops obtainable in fair quantity in other beds off Tignish. A summary of Mr. Halkett's reports appears as Appendix No. 4 of this report.

ROYAL COMMISSION ON ATLANTIC FISHERIES

Completion of the inquiry and report of the Royal Commission investigating the fisheries of the Maritime Provinces and the Magdalen Islands was an event of outstanding importance of the early part of 1928. The commission, which was appointed by the Dominion Government in October, 1927, held 49 hearings, many of them extending over several days, heard 823 witnesses in fishing and distributing centres, and received a number of written statements touching the questions which came before it. Hon. A. K. Maclean, President of the Exchequer Court, Ottawa, was the chairman of the commission, and the other commissioners were H. R. L. Bill, Esq., of Lockeport, N.S., Hon. J. G. Mombourquette, of L'Ardoise, N.S., Dr. Cyrus MacMillan, of Montreal, P.Q., and J. G. Robichaud, Esq., of Shippigan, N.B. By the Order in Council covering their appointment the commissioners were directed to inquire into and report upon the general condition of the fishing industry in the Maritime Provinces and the Magdalens, how existing conditions of the fisheries and fishermen might be improved, and how the industry might be further developed with expedition and efficiency. More particularly, they were directed to inquire into:

What should be done to increase the demand for fish both in the home and foreign markets; whether the spread in the price of fish between the producer and the consumer is excessive, and if so, what should be done to remedy the condition; what should be done to develop the inshore fisheries to their capacity; whether there should be any further restriction on steam trawlers operating from Canadian Atlantic ports, and, if so, what they should be; whether, keeping in view that no exceptional privileges are available to Canadian fishing vessels visiting United States ports, the so-called *modus vivendi* privileges, or any of them, should be renewed; whether or not the amount now annually distributed as fishing bounty should be continued on the present basis; whether there should be an inspection of fresh fish of all kinds as landed, as placed in storage, and as shipped from the coastal points; whether there should be an inspection and grading of dried fish; and whether there should be any modifications in the lobster fishery laws and regulations.

The report was issued in printed form, obtainable from the King's Printer, Ottawa, and it is, therefore, not necessary to make detailed reference here to all the commission's many findings and recommendations. Generally, the importance of the Atlantic coast fisheries was emphasized by the commissioners and continued and energetic state effort to further the operations of the fishermen and the fishing industry was justified and advocated. Throughout the report stress was laid upon the importance of continued attention to the task of setting and maintaining high standards of product quality. Strict enforcement of regulations and thorough inspection were urged as essential in the interests of the fishermen and all others connected with the industry. Outside the field of Dominion regulation, the commissioners recorded their "emphatic view that, in the interests of retailer and consumer alike, all retail fish shops should be subject to municipal regulation."

Dealing with the administration of the fisheries and departmental organization, the commission recommended the establishment of a separate Department of Fisheries, under a Minister of Fisheries, and reported a widespread feeling in the Maritime Provinces in approval of the action of Parliament in 1927 in authorizing the appointment of a Deputy Minister of Fisheries. Appointment of the Deputy Minister of Fisheries was made by the Government, effective from July 1, 1928, and announcement has been made by the Prime Minister that a separate Department of Fisheries, under a Minister of Fisheries, will be created. Other recommendations made by the commission in this regard included one for the establishment of a Fisheries Intelligence Division and increasing attention to gathering, compiling, and distributing accurate and complete statis-

tical information concerning the fisheries. As has been noted above, a Fisheries Intelligence and Publicity Division has now been established in the Fisheries Branch and has in hand both the work of expanding and improving the statistical and intelligence services previously undertaken and plans for the development of an adequate service covering conditions, supply and demand, and prices in the domestic and foreign markets. Suggestions made by the commission as to steps to widen and increase the usefulness of fishery officers are being followed up. In this connection there has been an expansion of the Fisheries Branch plan of giving special educational courses to fishery inspectors and overseers at the Halifax Experimental Station of the Biological Board. Two six-weeks courses were arranged with a view, particularly, to qualifying overseers as competent inspectors of fish treated by the various methods in preparation for market and qualifying them to impart effectively to fishermen instruction in the newest and best methods of handling and preparing for market by the different processes that must be employed. In this way the efficiency of the overseer and inspection service will be increased, surer guarantee will be given of the quality of the fish marketed, and greater assistance will be available to the fishermen in the efficient preparation of their catch and, therefore, in obtaining larger returns from their time and labour. One of these courses began in March, 1929, the other in April.

So far as the bounty system is concerned, the commissioners found that the present basis and method of distribution are, on the whole, satisfactory.

No grounds were seen, the commission reported, for recommending any modifications of the present Canadian policy as regards the *modus vivendi* privileges, which have not been granted United States vessels since 1924.

As to the Halifax Award, the commission recommended that the interest on the Award for 1879, 1880, and 1881 should be appropriated and applied for useful purposes in connection with the Atlantic fisheries or fishermen, such as assistance in the construction of rapid freezing plants, fish meal plants, bait and cold storage plants for organized groups of fishermen.

In regard to cold storage requirements and facilities, the commissioners reported that "for the present it would seem that the Cold Storage Act fairly well meets public requirements." Touching the question of departmental assistance toward the establishment of bait freezers, the recommendation of the commission was that aid be given—where necessity exists to departmental satisfaction—when and where the fishermen have organized for co-operative effort. The Experimental Station at Halifax, it was advised, should design a suitable brine freezer for bait and give necessary advice and instruction to any fisherman or group of fishermen desiring to make use of such a freezer. Plans for such a freezer have now been designed by the Experimental Station. Plans have also been prepared for a salt-and-ice freezer suitable for use by a fisherman or a group of fishermen.

In various sections of their report the commissioners laid emphasis upon rigorous enforcement of regulations for the conservation of the fisheries and for the maintenance of satisfactory standards of production, and upon the importance of continued effort by fishermen and curers and canners to ensure high quality in products sent to market. For instance, in referring to the lobster industry the commissioners urged "rigorous and impartial enforcement" of regulations, more careful manufacture, and strict inspection of plants and product. Standardization and branding of oyster shipments were recommended. New and definite grading of smelts, fixed by regulation, was advised, grading and inspection of dried fish for export, rigid inspection of pickled herring, extension of inspection to canned, frozen, and smoked fish, and the training of fishery overseers to inspect all kinds of fish. Expansion of the departmental policy of making instruction available to fishermen through travelling instructors was also recommended. Action in a number of these cases has been taken by the

Fisheries Branch, as, for example, the training of overseers to inspect fish of all kinds. Similarly, the further study of various problems and possibilities of the fishing industry, which was recommended by the commission, is being undertaken by the Fisheries Branch, through the Biological Board and otherwise.

In the case of the lobster industry the commission found that the number of canneries in the Maritime Provinces is "far in excess of the requirements of the industry" but that consumption in Canada can be increased by careful manufacture and by co-operative action by the canners in ensuring quality production and in marketing. Specific recommendation was made that all regulations bearing on closed seasons for lobster fishing be fixed by statute, and legislation touching this point—and likewise the establishment of statutory smelt fishing seasons—was submitted to Parliament at this year's session.

Exploratory surveys of Maritime Province waters with a view to determining the extent of the scallop resources, and further study of the scallop, were advised. A survey was also recommended to ascertain, if possible, the cause of oyster depletion in certain Maritime Province areas, to devise means of re-establishing these areas and to create new areas, to determine upon the best methods of cultivation, and to formulate plans for the instruction of fishermen or dealers in these methods. Exploratory surveys and study in regard to the scallop were begun by the Fisheries Branch prior to 1928 and the work has been continued from year to year with results that have already been useful. Oyster surveys have also been carried on by the Fisheries Branch from time to time; work of the kind, for example, was in progress during 1928; but difficulty in dealing with the oyster industry has existed because of conflict on the question of proprietorship of the oyster beds by the provincial Governments or the Dominion Government, and that conflict still exists in the case of beds in Nova Scotia and beds in New Brunswick. Further reference to the work of the Fisheries Branch, in connection with the conservation and cultivation of oyster resources will be found on page 212 of this volume.

Extended analysis of the facts entering into the price-spread between the fishermen and the consumers in Central Canada was made by the commission. Between the producer and the consumer, the report pointed out, there intervene a number of persons or organizations such as fish buyers or shippers, carriers, wholesalers, jobbers, and retailers, all of whom, of course, must be paid for their services. It is also to be kept in mind when comparing retail market prices with the prices paid to the fishermen, the commissioners noted, that there is a loss in weight when the heads of fish are removed or when the fish is filleted; when the head of a cod is removed 27 per cent of the weight of the fish in the round is lost and when a fish is filleted from 55 to 67 per cent, and "it is evident, therefore, that the prices of headless or filleted fish must reflect these losses." The cost of services rendered in delivering the fish from the shipper at the coast to the wholesaler in Montreal or Toronto, the commission found, is not excessive. The largest part of the price-spread apparently occurs between the retailer and the consumer. "It is said that a charge of 3½ cents per pound represents the average cost to the retailer for delivery to a household and that his general overhead expenses average 25 to 35 per cent on his annual turnover."

Emphasis was put by the commission upon the probable great gain to the fishing industry from development of the rapid-freezing process for marketing fresh fish. Treated by this process, which has been the subject of experimentation and testing by the Biological Board at the Halifax Experimental Station, the commission reported, fish are to all intents and purposes indistinguishable from unfrozen, freshly-caught fish, even after storage for six months under ordinary cold storage conditions. Consumers do not yet distinguish between air-frozen fish and rapidly frozen fish, the report went on, and departmental assistance may properly be given to advertising designed to convince the public of the improved quality of the rapidly-frozen product. "With judicious adver-

tising and demonstrations, we believe that this new form of package fish will soon win the favour of the Canadian consumer and will bring about a great and advantageous change in the fresh fish industry, with benefit alike to consumer and producer."

Divided opinion was reached by the members of the commission in regard to restriction or prohibition of steam trawling. Messrs. Bill, MacMillan, Mombourquette and Robichaud presented a report recommending that trawlers be prohibited from landing their fish and obtaining supplies at Canadian ports. Chairman Maclean disagreed with this finding. In the majority report as to the trawler it was recommended that the Government take action looking to the formulation of international agreements for regulating all vessels fishing on the North Atlantic banks, "particularly for the protection of fishermen's gear and for the more complete conservation of the fisheries in those areas." Hon. Mr. Maclean recommended that the Government seek to bring about a conference of the nations whose vessels fish the North Atlantic with a view to the enactment of international regulations governing the operations of trawlers in these waters; and to bring about also the creation of an international body to study the life history and migration of cod and haddock, how trawlers may be regulated, whether any fishing grounds should be closed to trawlers, and whether certain grounds cannot withstand unregulated trawler fishing. Legislation touching trawlers was submitted to Parliament at its 1929 session.

Formulation of an adequate plan of fishery education and a plan for departmental assistance in the establishment of co-operative fishermen's organizations was recommended by the commission. The educational plan, it was advised, should be formulated by the Biological Board in consultation with the department, the Director of the Halifax Experimental Station, the Provincial Education Departments, and representatives of the Dalhousie University School of Fisheries. A skeleton form of organization for the suggested co-operative undertaking was outlined by the commission, with the appointment of an organizer by the department and a survey of the fishing communities as the initial steps proposed.

At the present time there are already a number of fishermen's unions in the Maritime Provinces; in Nova Scotia the several local units of the union or federation have a total membership of upwards of 2,000. In some cases these local unions have undertaken co-operative action in the purchase of supplies, but co-operative marketing has not been tried except in one or two instances. Certain advantages, it is recognized, would follow from the application of co-operative sales methods as suggested by the commission, but the organization and operation of a large-scale co-operative sales movement among the fishermen of the Atlantic coast would be a complex undertaking, with a careful and thorough study of the subject a vital prerequisite. Organization of the co-operating units would probably not in itself be difficult, after an intelligently-conducted campaign of education; nor would there be exceptional difficulty in working out a plan for the co-operative purchase of goods by the local unions. It seems likely, however, that the devising and successful operation of a system for the co-operative marketing of fish would be an intricate and very difficult task. Such a system would involve the creation of market connections which the fishermen themselves do not now have; the establishment of extensive facilities for handling and storing fish; the ability of the co-operatives to guarantee steady supply at all times to the markets which entered into relations with them; and important and, often, complicated questions of finance, not only questions in connection with the establishment and maintenance of facilities and marketing agencies but questions created by the fluctuations which are inevitable in market conditions when the field of sale and competition is virtually the world and the product is perishable. It is such considerations as these

which make it imperative that any survey such as is recommended by the commission should be made with the utmost care and that any plans devised should be subjected to the most searching analysis before they are put to the trial of actual operation. This care and analysis are imperative in the interests of all concerned, and, above all, from the standpoint of the welfare of the fishermen who would be most affected by the faulty operation of any plan too hastily evolved and put into effect.

It is apparent, however, that thorough organization of the fishermen to enable them in a collective way to consider their problems, make their purchases, improve their methods of production by co-operative effort, etc., as well as to enable the department to have a ready means of contact with them as a body, is eminently desirable. Measures to this end are under consideration. Marketing of their products in a co-operative way could probably best be developed through such organization.

NORTH AMERICAN COMMITTEE ON FISHERY INVESTIGATIONS

This committee, which forms a medium for the correlation of investigations by Canada, the United States, Newfoundland and France in connection with the fisheries of North American waters, has been in existence since 1921 and has in the indirect fashion in which it operates (it expends no funds whatever) been extremely effective in forwarding the solution of important problems in Canada's fisheries. During the year 1928 two meetings were held, one at Boston, Mass., on June 2, and the other at Toronto, Ont., on October 22. The Canadian representatives on this committee are Prof. J. P. McMurrich, chairman of the Biological Board, Prof. A. G. Huntsman, Senior Director under the board, and the undersigned.

The committee issues no publications, the results of investigations, with which it deals, being made public through other agencies. It is, however, sponsoring a series of publications on the fisheries, the second of which has been released during the year, entitled "Statistics of the Haddock Fishery in North American Waters," by A. W. H. Needler, and is being published by the several countries concerned. A study of the available statistics collected by the Governments of the United States and of Canada reveals a steady and rapid increase in the haddock catch since 1921. So rapid has been the recent increase that the total catch is now far ahead of that of former years, and is approximating twice the amount of the catch in the early years of the century. This change has been caused by the increases in the numbers and in the total landings of the New England otter trawlers, of which landings haddock form eighty per cent. On the other hand the Canadian catch shows no increase. The catch rose during the war to the greatest figure on record, that of seventy-eight million pounds in 1917, but there was a severe post bellum depression, culminating in 1921 in the lowest figure on record, that of twenty-seven million pounds. There has not yet been sufficient recovery from this condition for the catch to equal what it was even before the war. In the Canadian fishing area the inshore catches are greatest near Digby, Canso, and Ingonish, N.S., while the offshore catches are chiefly on Brown's and Sable island banks. The offshore catches showed a greater post bellum depression than did those inshore, but they recovered more quickly, so that the net result has been a relative gain for the offshore catches attributable largely to the otter trawl fishery.

There is very definitely an increasing demand on this continent for haddock, and the committee views with very considerable concern the increasing intensity of the haddock fishing, and sees as the only possible result that the haddock will be increasingly more difficult to obtain, and that the average size will drop, and it has requested the Governments concerned to at once make every effort to investigate the situation thoroughly.

The cod fisheries of the western North Atlantic, in which, next to Newfoundland, Canada has the greatest interest, are being carefully followed so that any unfavourable trend may be quickly discerned. Very considerable co-operative tagging has been accomplished by the United States and Canada, which has shown that there is a very complex arrangement of more or less local races with quite diverse habits of migration. None of the diverse schools that summer in the vicinity of cape Cod have as yet been found to reach the Canadian coast or offshore banks, but those in the western part of the gulf of Maine and on the Maine coast not infrequently cross to Nova Scotian waters, as do those from Brown's bank in contrast with those from Georges.

On the other hand the fish, that in the summer are in the vicinity of cape Sable, N.S., move on the whole eastward, during the latter part of the year, some as far as Halifax, but a few migrate westward past cape Cod and as far as Long island. Cape Breton fish do not move coastwise to any great extent, but retreat during winter to the offshore banks such as Banquereau and Sable island. Occasional ones may cross over to St. Pierre bank off the Newfoundland coast, or in summer penetrate the gulf of St. Lawrence as far as the coast of Gaspé.

Tagging of the mackerel has also been carried on and it has been found that the school striking the eastern end of Nova Scotia in the spring and that in part migrates into the gulf as far as Prince Edward Island during the summer, retreats to the Atlantic during the winter, but some may go no farther than Sable island bank by January. Growth in this fish is, at first, extremely rapid, as a length of about ten inches is attained by the end of the first year, but at the end of the third year the length is only about fourteen inches and there is very little growth thereafter.

The committee is furthering plans for a better knowledge of water conditions in the Atlantic. There is now established a series of stations along the coasts of the United States and of Canada for regular observation of the temperature of the water throughout the year, with the object of determining the influence of temperature on the various fisheries. The study of the movement or circulation of the waters of the ocean by means of drift bottles has recently been confined to the north from the estuary of the St. Lawrence to Hudson strait. In the gulf of St. Lawrence a pronounced movement from the Gaspé coast to the west side of Newfoundland has been demonstrated, and the water issuing from Hudson strait and passing southward along the coast in the Labrador current has been found to cross the Atlantic to the British Isles and Iceland at the particularly rapid rate of from ten to twelve miles per day, which is half again as fast as has been shown for the water off the Nova Scotian banks.

The committee has had under consideration the matter of the proposed damming of Passamaquoddy and Cobscook bays on the international border between the province of New Brunswick and the state of Maine by the Dexter P. Cooper Company for power purposes. This district furnishes the greatest and most valuable shore fishery of the whole coast, and it seemed probable that that fishery might be irreparably damaged by the installation of the dams. From a detailed study of the matter, for which the chief basis consisted in the results of many investigations made by various scientists at the Atlantic Biological Station, St. Andrews, N.B., Dr. Huntsman, the Director of the Station, had made and published predictions of the various effects that would follow the installation of the dams. The chief of these was the prediction that the most important fishery of the district, namely that for the large and small herring, the latter being canned as sardines, would be virtually wiped out as the result of the interference with a tremendous mixing mechanism at the mouths of the bays concerned, by which widespread effects on the temperatures of the

water and air, on the fertility of the water, and on the growth of plants and animals in the water, are produced. A sub-committee was appointed to proceed to the district to examine into conditions there, to consider the plans of the power company, and to study all available information bearing upon the predictable effects of the project on the fisheries of the region. The sub-committee procured the services of several Canadian and United States engineers with tidal and hydraulic experience for expert opinion on certain phases of the problem. The sub-committee finally reported to the two Governments concerned, namely those of Canada and of the United States,—

(1) That in its opinion, if the proposed construction is carried out, the weir fisheries for herring inside the dams will be almost wholly eliminated.

(2) That it recognizes that the effects on the fisheries outside the dams predicted in the report on the subject presented by Dr. Huntsman may follow, but the committee as a whole is not prepared to forecast whether these results will or will not follow, believing that a fuller investigation is needed.

INTERNATIONAL HALIBUT COMMISSION

During the year further material necessary to a continuous record of the past and present of the Pacific halibut fishery was collected by the staff of the International Commission created under the Pacific Halibut Convention between Canada and the United States and laid what is believed to be a secure statistical foundation for carrying on adequate future observation. Under the convention the commission is charged with the duty of making thorough investigation into the life-history of the Pacific halibut and of making recommendations to the two Governments for such regulation of the fishery as may seem desirable for its preservation and development.

Collection and analysis of records of the fishery have been extended as far back as material is available. In the matter compiled there has been included analysis of the total landings of the vessels and the returns per standardized unit of gear in each case. So far as possible, this analysis has been made according to the several divisions of the banks which are to be regulated. From this foundation the future history of the fleet, of the landings, and of the abundance can be safely carried on.

In the main, the biological work done under the commission during the year has been the preparation for publication of material previously collected. Certain facts as to the migration and the segregation of halibut were confirmed and elaborated. It has been shown that the stock on the banks, particularly in British Columbia waters, is relatively stable, but this stock in British Columbia waters is largely immature and it has been found that the more mature halibut population in the gulf of Alaska is more migratory. At the same time, even the mature fish show a degree of segregation according to area, and the further investigation of facts in this connection has made it evident that regardless of what action may be taken in segregating areas for purposes of differential regulations, the degree of inter-dependence of the fish populations will qualify the application and effectiveness of any regulations.

In connection with this phase of the work it would seem that the migration of those fish which are of a size suitable for the commercial fishery is of primary importance. It is by the depletion of those sizes that the ill-effects on the fishery have been produced. It follows that action to conserve the different stocks in these areas, so that each such stock will yield its quota of eggs, should serve the immediate purpose of conservation.

Field work at sea was continued during the year, since it was realized that the work upon the mature halibut was still deficient, and the study of stocks farther westward incomplete, and because the history of the eggs and larvæ is very important from the standpoint of the inter-dependence of the stocks of fish. With a view to determining the relative amount of spawn, and to make sure that spawners were actually absent from British Columbia waters where it had been impossible to find any considerable stock of spawning fish, a series of hauls with silk plankton nets were made in these waters where the persistence of the fishery has seemingly been due to extensive drift of eggs and larvæ. Other net hauls were made in January and February in order to capture later stages of larvæ than had been taken in hauls the previous year and to determine their location. Search for post-larval stages was made in British Columbia and Alaska waters by means of otter trawls. In investigating the duration of larval life hydrographic data collected in 1927-28 was worked up during the past year and a new series of sections was made in the gulf of Alaska to check and perfect previous work of the kind. It is believed by the Director of Investigations that the net hauls and hydrographic work that have been carried on should lead to conclusions upon the drift and rapidity of development of the very early stages.

FRASER RIVER SOCKEYE SALMON TREATY

Negotiations which continued throughout the year for the consummation of a treaty between Canada and the United States looking to the restoration and future protection of the sockeye salmon fishery of the Fraser river system under the joint auspices of the two countries came to a successful close on March 27 when the treaty was signed at Washington, subject to approval by the Canadian Parliament and the United States Senate. Under this treaty, which is to be effective for at least sixteen years, a commission of six members, equally representative of the two countries, is to be set up and will make thorough investigation of the sockeye fishery, supervise fish cultural operations for restocking the Fraser river, and, acting within certain defined limits, will regulate sockeye fishing and fishing seasons.

It is interesting to note, in passing, that as the first treaty to be signed by a Canadian minister alone in behalf of His Majesty was one having to do with the fisheries, the Pacific halibut convention of 1923, so the sockeye salmon treaty of 1929 was the first treaty to be signed by Canada's Minister to the United States. The signing of this latter treaty is also one more recognition of the fact that several of the Canadian fisheries must be regarded from a North American standpoint if they are to be properly utilized and conserved.

The Fraser river system, which includes the gulf of Georgia and Juan de Fuca strait as well as the Fraser river, is potentially the greatest sockeye-producing area in the world. In 1913 it yielded a pack of 2,357,695 cases, or 113,169,360 pounds, which, at to-day's prices, would be worth approximately \$42,500,000. Since that time a combination of causes has enormously lessened the catch so that in 1928 the pack was only 86,611 cases, or 4,157,328 pounds, with a marketed value of approximately only \$1,500,000. It is believed that the restoration of the diminished fishery can be accomplished by means of intelligent fish cultural operations and strict enforcement of carefully considered protective regulations, but action in this case, to be effective, must obviously be taken jointly by Canada and the United States since some of the waters in the Fraser system are Canadian and others are United States waters. Equally obviously, the restoration of the fishery is an undertaking of vast economic importance, and the provisions of the treaty and a general statement as to the facts of the Fraser situation may very well be included in this report.

The Fraser river sockeye is predominantly a four-year fish; that is, it reaches maturity, spawns, and dies when it is four years old. The run in any year, therefore, depends on the extent of reproduction four years previously. The sockeye reproduces, moreover, not only in the same river system in which it was hatched but in the very tributary of the system. If for any reason spawning sockeye are prevented from reaching the particular area in which they were hatched, the fishery will be depleted by that much, even though other spawning grounds in the same river system were accessible to the fish. Years ago there existed in the Fraser river a peculiar phenomenon in that there was an enormous run of sockeye every fourth year, with much smaller runs in the intervening years; it was this condition that led to the use of the terms "big years" and "off years" in connection with this sockeye fishery. The explanation of the phenomenon is only conjectural but the theory commonly held is that at some time there was a rock slide which, for three successive seasons, prevented the fish from ascending the river to spawning grounds above Hell's Gate, the narrow gorge which is the mouth through which the turbulent waters of the Fraser find their outlet from the Great canyon formed by the Cascade and Coast mountains. By the fourth season, according to this commonly held theory, the action of the water had sufficiently cleared away the obstruction to permit the salmon to make their way through and the phenomenon of one "big year" in every four resulted.

Nineteen hundred and thirteen was a "big year" but, disastrously, before the time for the sockeye run quantities of rock that tumbled into the river as a result of the construction of the Canadian Northern railroad along the left wall of the canyon made the ascent of salmon through certain parts of the canyon impossible. This condition was not foreseen by anyone before the sockeye run began as there was no apparent reason for supposing that the rock thrown into the river by the blasting had so obstructed the waters that salmon would not be able to pass. It developed, however, that sockeye making for spawning grounds which lay above Hell's Gate could not reach them and reproduction was practically confined to the lower areas which made up only about twenty-five per cent of the spawning grounds of the river. Early in the following year a rock slide from the mountain side still further obstructed the canyon. Action toward the removal of both obstructions was initiated promptly by the Fisheries Branch and was carried through as quickly as possible, but the work could not be accomplished in time to meet the needs of the 1913 run of fish. As already noted, 1913 was a "big year" but since that season, with its obstruction of Hell's Gate canyon, there has been no "big year" which has been at all comparable in catch to those which had gone before, and, moreover, the catch has continued to decline. In the three seasons since 1913 which, chronologically, were "big years"—that is, 1917, 1921, and 1925—the packs of sockeye in the Fraser system were 535,152 cases, 138,867 cases, and 137,587 cases, respectively. Practically, the "big years" have ceased to occur. To-day, it may be noted, conditions in the river are as favourable, so far as freedom of ascent for the salmon is concerned, as they were prior to 1913 and restocking of the depleted areas under a fish cultural program would be followed in due course, it is believed, by a restoration of the fishery to its former productivity.

The sockeye salmon fishery, in a commercial way, began on the Canadian side in 1876 and in the United States waters of the Fraser system in 1877. Under intensive fishing the catch in the "off years" declined, but the "big year" runs continued enormous, without sign of depletion, until after 1913. Coming in from the ocean the sockeye, for the most part, pass through the waters on the United States side of Juan de Fuca strait and the gulf of Georgia, presumably because the waters of the Fraser flow outward on that side. One result of this condition has been that the fishermen of the state of Washington

have had first opportunity in the fishing when the sockeye runs set in and with their traps and seines they have been taking the major part of the catch. Last year, for example, the pack of sockeye on Puget sound was 60,081 cases and on the Fraser river it was only 26,530 cases; in other words, while the sockeye reproduction takes place in a Canadian river the greater part of the sockeye catch has been taken by United States fishermen in United States waters, and this point is made still clearer by a statement covering the period from 1902 to 1928, inclusive, which appears on page 116 of this report. That this condition is lacking in fairness was recognized in the negotiations leading up to the drafting of the new treaty and an article was incorporated—Article VII—under which the commission is required so to regulate fishing that, as nearly as may be possible, half the catch will be taken by the Canadian fishermen and half by United States fishermen.

The 1929 treaty is an expression of the third effort to meet the situation by international action and restore and protect the sockeye fishery. The treaty of 1908 for the regulation and protection of the fisheries in all waters adjacent to the international boundary line partly covered the sockeye fishery but though the necessary action in this connection was taken by Canada the regulations drawn up under the treaty were not approved by the United States Senate. For several years Canada continued to urge that the regulations be approved by the United States but in 1914, when it was evident that this approval was not to be given, the Dominion resumed liberty of action from the treaty. The Fraser river question was also among the subjects referred to the International Fisheries Commission of 1918 which recommended, unanimously, that a treaty be entered into looking to the re-establishment and protection of the sockeye fishery. A treaty as suggested by the commission was drafted and was signed in 1920, but it was not approved by the United States Senate.

The text of the treaty of 1929 is as follows:—

His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India, and the President of the United States of America, recognizing that the protection, preservation and extension of the sockeye salmon fisheries in the Fraser river system are of common concern to the Dominion of Canada and the United States of America; that the supply of this fish in recent years has been gravely depleted and that it is of the utmost importance in the mutual interest of both countries that this source of wealth should be restored and maintained, have resolved to conclude a convention and to that end have named as their respective plenipotentiaries:

His Majesty, for the Dominion of Canada;

The Honourable Charles Vincent Massey, P.C., His Envoy Extraordinary and Minister Plenipotentiary for Canada at Washington; and

The President of the United States of America;

Mr. Frank D. Kellogg, Secretary of State of the United States of America;

Who, after having communicated to each other their full powers, found in good and due form, have agreed upon the following articles:

ARTICLE I

The provisions of this convention and the regulations issued pursuant thereto shall apply to the Fraser river and the streams and lakes tributary thereto and to all waters frequented by sockeye salmon included within the following boundaries:—

Beginning at Carmanah lighthouse on the southwest coast of Vancouver island, thence in a straight line to a point three marine miles due west astronomic from Tatoosh lighthouse, Washington, thence to said Tatoosh lighthouse, thence to the nearest point of cape Flattery, thence following the southerly shore of Juan de Fuca strait to point Wilson, on

Quimper peninsula, thence in a straight line to point Partridge on Whidbey island, thence following the western shore of the said Whidbey island to the entrance to Deception pass, thence across said entrance to the southern side of Reservation bay, on Fidalgo island, thence following the western and northern shore line of the said Fidalgo island to Swinomish slough, crossing the said Swinomish slough, in line with the track of the Great Northern railway, thence northerly following the shore line of the mainland to Atkinson point at the northerly entrance to Burrard inlet, British Columbia, thence in a straight line to the southern end of Bowen island, thence westerly following the southern shore of Bowen island to cape Roger Curtis, thence in a straight line to Gower point, thence westerly following the shore line to Welcome point on Seechelt peninsula, thence in a straight line to point Young on Lasqueti island, thence in a straight line to Dorcas point on Vancouver island, thence following the eastern and southern shores of the said Vancouver island to the starting point at Carmanah lighthouse as shown on the United States Coast and Geodetic Survey Chart number 6300, as corrected to October 20, 1924, and on the British Admiralty Chart number 579.

The high contracting parties engage to have prepared as soon as practicable charts of the waters described in this article, with the above described boundaries and the international boundary line indicated thereon. They further agree to establish within the territory of the Dominion of Canada and the territory of the United States such buoys and marks for the purposes of this convention as may be recommended by the commission hereinafter authorized to be established, and to refer such of these recommendations as relate to points on the boundary to the International Boundary Commission, United States-Alaska and Canada, for action pursuant to the provisions of the treaty respecting the boundary between Canada and the United States signed February 24, 1925.

ARTICLE II

The high contracting parties agree to establish and maintain a commission to be known as the International Pacific Salmon Fisheries Commission, hereinafter called the commission, consisting of six members, three on the part of the Dominion of Canada, and three on the part of the United States of America.

The commissioners on the part of the Dominion of Canada shall be appointed by His Majesty on the recommendation of the Governor General in Council. The commissioners on the part of the United States shall be appointed by the President of the United States, and the Commissioner of Fisheries of the United States shall be one of them.

The commission shall continue in existence so long as this convention shall continue in force, and each high contracting party shall have power to fill and shall fill from time to time vacancies which may occur in its representation on the commission in the same manner as the original appointments are made. Each high contracting party shall pay the salaries and expenses of its own commissioners, and the joint expenses incurred by the commission shall be paid by the two high contracting parties in equal moieties.

ARTICLE III

The commission shall make a thorough investigation into the natural history of the Fraser river sockeye salmon, into hatchery methods, spawning ground conditions and other related matters. It shall conduct the sockeye salmon fish cultural operations in the area described in Article I, and to that end it shall have power to improve spawning grounds, acquire, construct, and maintain hatcheries, rearing ponds and other such facilities as it may determine to be necessary for the propagation of sockeye salmon in the waters covered by this

convention, and to stock the waters with sockeye salmon by such methods as it may determine to be most advisable. The commission shall also have authority to recommend to the two Governments the removal of obstructions to the ascent of sockeye salmon in the waters covered by this convention, that may now exist or may from time to time occur, and to improve conditions for the ascent of sockeye salmon, where investigation may show such to be desirable. The commission shall report annually to the two Governments what it has accomplished and the results of its investigations.

The cost of all such work shall be borne equally by the two Governments, and the said Governments agree to appropriate annually such money as each may deem desirable for such work in the light of the reports of the commission.

ARTICLE IV

The International Salmon Fisheries Commission established pursuant to Article II of this convention is hereby empowered, between the first day of June and the twentieth day of August in any year, for the whole or any part of the aforesaid period, to limit or prohibit the taking of sockeye salmon in respect of all the waters described in Article I of this convention, or in respect of Canadian waters and waters of the United States separately, provided, that when any order is adopted by the commission limiting or prohibiting the taking of sockeye salmon in regard to Canadian waters or waters of the United States separately, it shall extend to all of the Canadian waters or waters of the United States to which this convention applies, and provided further, that no order limiting or prohibiting the taking of sockeye salmon adopted by the International Salmon Fisheries Commission shall be construed to suspend or otherwise affect the requirements of the laws of the Dominion of Canada or of the state of Washington as to the procuring of a license to fish in the waters on their respective sides of the boundary line. Any order adopted by the commission limiting or prohibiting the taking of sockeye salmon in said waters during said period, or any part thereof, shall remain in full force and effect unless and until the same be modified or set aside by the commission. The taking of sockeye salmon in said waters during said period in violation of the orders of the commission adopted from time to time is hereby prohibited.

ARTICLE V

In order to secure a proper escapement of sockeye salmon during the spring or chinook salmon fishing season, the International Salmon Fisheries Commission may prescribe the size of the meshes in all fishing gear and appliances operated in the waters described in Article I of this convention which are frequented by sockeye salmon.

Whenever the taking of sockeye salmon in said waters during said period between the first of June and the twentieth of August in any year is permitted under the orders adopted by the commission in respect of Canadian waters any fishing appliances authorized by the laws of the Dominion of Canada may be used in such waters by any person thereunto legally authorized, and whenever the taking of sockeye salmon in said waters during said period is permitted under the orders adopted by the commission in respect of waters of the United States, any fishing appliance legally authorized by the state of Washington may be used in such waters by any person thereunto authorized by that state.

ARTICLE VI

No action taken by the commission under the authority of Articles IV and V of this convention shall be effective unless it is affirmatively voted for by at least two of the commissioners from each country.

ARTICLE VII

Inasmuch as the purpose of this convention is to establish for the high contracting parties, by their joint effort and expense, a fishery that is now largely non-existent, each of the high contracting parties should share equally in the fishery. The commission shall, consequently, in regulating the fishery do so with the object of enabling, as nearly as they can, an equal portion of the fish that is allowed to be caught each year to be taken by the fishermen of each high contracting party.

ARTICLE VIII

Each high contracting party shall be responsible for the enforcement of the regulations provided by the commission in the portion of their respective waters covered by the convention, and to this end they agree to enact and enforce such legislation as may be necessary to make effective the provisions of this convention, with appropriate penalties for violations thereof.

ARTICLE IX

The present convention shall be ratified by His Majesty in accordance with constitutional practice, and by the President of the United States of America, by and with the advice and consent of the Senate thereof, and it shall become effective upon the date of the exchange of ratifications which shall take place at Washington as soon as possible and shall continue in force for a period of sixteen years, and thereafter until one year from the day on which either of the high contracting parties shall give notice to the other of its desire to terminate it.

GLOUCESTER FISHERMEN'S ASSOCIATION

An interesting step among New Brunswick fishermen during the fiscal year was the organization of the Gloucester Fishermen's Association, incorporated by an Act of the New Brunswick Legislature, for the purpose of "the fostering of team work among the fishermen of the county of Gloucester for the betterment of their general economic status." The program of the association includes in the effort to better the economic status of its members, "improving the actual quality and standard of same (fish) product already prepared for the market, finding new markets, mainly improving actual market conditions, sales organizations, and methods." When the first general meeting of the association was held on March 27, following a series of organization meetings in different sections of the county, 690 members had been enrolled. Mr. L. Bérubé, who was employed by the Fisheries Branch, and Mr. J. G. Robichaud, of Shippigan, N.B., who was a member of the Royal Commission which made investigation into the fisheries of the Maritime Provinces and the Magdalen islands in 1927 and 1928, assisted in the organization meetings, but the point stressed on all occasions was that responsibility for the work of the association and for its success or failure would rest upon the members themselves. Under its act of incorporation the association is empowered to own real estate not exceeding \$50,000 in value; to build, own, operate, lend, let or sell fishing boats; to organize, manage and, if necessary, finance any system to give credit facilities or advances of money to its members for building fishing boats or buying fishing rigging or supplies; and to organize, under the federal laws, and manage and finance mutual life and accident insurance among its members and mutual insurance on boats and fishing rigging or buildings owned by its members. If so desired, the association may carry such insurance for its members with any insurance company registered in Canada. An important section of the charter authorizes

the association to organize a business department to take charge of buying rigging or supplies, marketing fisheries products, and carrying on a general fish trade on behalf of such members as wish to take advantage of this service. Under the charter the association, when it deems such action desirable, may convert the business department into "definite commercial co-operative organizations . . . but, for the present, the operations of such department are for the service and at the risk of such members only of the association as desire to avail themselves of it."

Your obedient servant,

WILLIAM A. FOUND,

Deputy Minister of Fisheries.

APPENDIX No. 1

REPORTS OF SUPERVISORS OF FISHERIES

REPORT OF ACTING CHIEF SUPERVISOR SHREVE,

PROVINCE OF NOVA SCOTIA, FOR 1928

Only once since 1921 has the product of the fisheries of Nova Scotia had a larger value than that of the year 1928. While it is true that during recent years the value for the year 1926 exceeded the value for the year under review, it must be considered that 1926 was an exceptional one. The values recorded during the war years of 1917 and 1918, as well as the post-war years of 1919 and 1920, were in excess of the values obtained this year, but, of course, inflated prices prevailed during those years and therefore a comparison from a monetary standpoint is scarcely fair.

Omitting the war years of 1917 and 1918 and the post-war years of 1919 and 1920, the year 1928 ranks second in the history of the province, only having been exceeded by the year 1926. Therefore the operations for the 1928 season may be considered as successful.

The marketed value for 1928 was \$11,681,995.

The value of the fisheries to the province of Nova Scotia for the past six years has been as follows:—

1923.....	\$ 8,448,385
1924.....	8,777,251
1925.....	10,213,779
1926.....	12,505,922
1927.....	10,783,631
1928.....	11,681,995

The cod fishery as usual maintained first position, followed by the lobster fishery, the haddock fishery ranking third in importance.

The fresh fish trade continued to expand and the future outlook is promising. Improved brine freezing methods will undoubtedly be further developed, and open up more avenues of trade. There was a considerable increase in the output of fresh fillets, both haddock and cod, as well as hake and cusk. Smoked fillets were also in good demand, and the production was increased considerably. Dried cod is the most important feature of the cod fishery, and this phase of the industry also showed considerable expansion. Boneless fish were also put up in larger quantities.

The catch of the chief commercial varieties such as cod, haddock, hake, cusk, pollock and swordfish also showed increased landings. The lobster fishery, which is one of the most important of all, records a decrease, as did the halibut, herring, mackerel, salmon, smelt and scallop fisheries, as compared with the year of 1927.

COD

The catch for 1928 shows an increase of 138,299 cwt. over the previous year. The catch was 1,470,172 cwt., having a landed value of \$2,822,472 and a marketed value of \$4,398,019, as compared with a catch of 1,331,873 cwt., with a landed value of \$2,433,699 and a marketed value of \$3,455,772 for the year 1927. The marketed value was increased by \$942,247. While there was

a slight shrinkage in the amount of cod used fresh, the quantity converted into fresh fillets, green salted, canned, smoked, smoked fillets, dried, and boneless, shows a substantial increase in each case. The output of fresh fillets almost doubled that of 1927. There was also a considerable increase in the amount of boneless cod prepared.

LOBSTERS

The lobster catch fell off from the preceding year by 7,264 cwt., and there was consequently a shrinkage in both the landed and marketed values. The total catch for 1928 was 172,409 cwt., having a marketed value of \$3,048,255, as compared with 179,673 cwt., with a marketed value of \$3,255,627, for 1927.

At the opening of the season on the west coast of the Island of Cape Breton the weather was very favourable for fishing and no drift ice appeared. It is claimed that this was the first season in thirty-seven years that this coast was free of drift ice at the opening of the season. Lobsters were plentiful at the start, but a severe gale took place on May 24 and 25, completely upsetting the industry for a week or ten days, and after the gale subsided lobsters were not so numerous.

The catch in the eastern mainland section of the province was above that of last year. This section, until a few years ago, was devoted entirely to the canned lobster trade, but of late the fresh lobster trade has opened up and is developing more and more each year. Fresh shipments are increasing from year to year. This is particularly true of Pictou and Antigonish counties. For the first time a lobster pound was operated at Pictou, to take care of shipments brought in from the late season in the Magdalen Islands.

The catch in the western section suffered a considerable drop.

The pack likewise shows a drop, as 494 cases less were packed this year than last.

The total pack for 1928 was 55,277 cases, as compared with 55,771 cases during 1927. The value of the pack naturally suffered. For 1928 the value of the pack amounted to \$1,465,239, as compared with \$1,727,105 for the previous year.

While indications are that the world consumption of canned lobsters was greater this year than in 1927, prices received were comparatively low. The re-entry of the Newfoundland pack on the market, after a closed season of four years, made available a considerable increased quantity of canned lobsters, and caused a decided drop in prices, and the general selling levels were reduced.

Both English and American buyers early in the season were hesitant in placing orders, but eventually canned lobsters were sold to about the same extent as formerly. The continental market was very dull. Japanese crab meat, offered at very attractive prices, especially to the continental market, caused serious interference with the operators in the canned lobster trade.

HADDOCK

The haddock fishery registers an increase of 61,743 cwt. The landings this year were 445,950 cwt., as compared with 384,207 cwt. during the previous year. The landed value for the year was \$917,404, and the marketed value \$1,654,977, as compared with a landed value of \$660,669 and a marketed value of \$1,402,135 for 1927. Large landings were made at Halifax, Ingonish, Petit de Grat, Port Hawkesbury and various ports in western Nova Scotia.

HAKE AND CUSK

The landings of hake and cusk amounted to 158,744 cwt., having a marketed value of \$268,577, as compared with a catch of 119,431 cwt. and a value of \$153,840 for the year 1927. Increased landings were made along all portions of the coast. The increased catches in the western part of the province were particularly noteworthy. The increase of the catch for the province was 39,313 cwt., while the marketed value was \$114,737.

MACKEREL

The only portion of the coast of the province to show an increase in the catch of mackerel was the western section. The total catch for the province was lower than last year. During 1927 the catch was 72,306 cwt., as against 71,440 for 1928. The landed value for 1927 was \$236,796 and the marketed value \$338,851, as compared with a landed value of \$244,916, and a marketed value of \$369,752 for the year under review. Better prices prevailed this year, and in spite of the lower catch, the market value registers an increase of \$30,901 over the previous year.

HERRING

The herring catch fell off to a great extent. While larger landings were made in the Island of Cape Breton, greatly decreased catches were secured in Western Nova Scotia. The catch was 166,398 cwt., with a landed value of \$167,831, and a marketed value of \$368,221, as compared with 214,560 cwt., having a landed value of \$225,175, and a marketed value of \$482,378 during 1927.

Spring herring were unusually plentiful in the waters of Cape Breton Island. The July run, however, was a failure. There was a general scarcity of spring and summer herring along the eastern coast of the mainland, although in October a heavy run entered the waters of Western Halifax county.

HALIBUT

There was a decrease in the halibut catch, as compared to the previous year, of 1,783 cwt. The landings during 1928 were 25,768 cwt., having a landed value of \$297,703, and a marketed value of \$434,110, as compared with a catch of 27,551 cwt. with a landed value of \$342,391, and a marketed value of \$468,679 for 1927. The decrease in the marketed value amounted to \$34,569. All sections of the coast show decreased landings, as compared with the previous year.

SALMON

The salmon fishery was disappointing and shows a decrease of 5,760 cwt., as compared with the landings in 1927. All sections of the coast showed decrease. The catch of Cape Breton island was roughly about half of that of last year. The eastern section of the mainland catch dropped over 2,000 cwt., while Western Nova Scotia shows a loss of over 1,100 cwt. The landings in the western portion of the province were less than half of the landings of last year.

The total quantity of salmon taken in the province was 7,059 cwt., as compared with 12,819 cwt. during 1927. The comparative landed values were \$112,340 and \$181,583, respectively. The marketed value for this year was \$138,681, while in 1927 it was \$233,189.

SCALLOPS

The scallop fishery suffered quite a severe decline, as compared with the previous year. However, it must be taken into consideration that 1927 was a record year, when 37,607 barrels were produced. During 1928 the production was 24,533 barrels, which is much in advance of the catch for any previous year, with the exception of 1927. The catch for the past six years has been as follows:—

	Barrels
1923.....	11,839
1924.....	7,504
1925.....	12,404
1926.....	19,918
1927.....	37,607
1928.....	24,533

It will therefore be seen that the apparent decline in 1928 is not nearly as serious as would appear at first glance.

The marketed value was also in excess of that for any of the years above referred to as will be seen from the following:—

1923.....	\$ 72,547
1924.....	51,793
1925.....	76,025
1926.....	138,472
1927.....	212,838
1928.....	156,188

The catch in Lunenburg county was about half of that of last year, while decreases took place in the large scallop producing areas of Digby and Annapolis counties. However, the fishery, compared on the average with previous years, was quite successful.

SMEELTS

The total catch for the year was 6,089 cwt., having a marketed value of \$103,535, compared with a catch of 7,110 cwt., valued at \$124,653 during 1927. At the opening of the season mild weather prevailed and the fishery was not prosecuted as vigorously as usual, as the fishermen were afraid they could not get their catches to market in good condition.

OYSTERS

The oyster catch for the province shows a slight increase over that of the previous year. The catch was 1,944 barrels, having a marketed value of \$15,935, as compared with 1,817 barrels, with a marketed value of \$16,109 for 1927. The largest landings, made in Cape Breton Island, were as follows:—

	Barrels.
Dennys Basin and Orangedale.....	697
Nyanza Bay.....	200
Estmere.....	86
Washabuck.....	73

The greatest increase in the catch took place at Nyanza bay, where 200 barrels were landed, compared with 102 barrels in 1927. The oyster fishery along the shores of the mainland bordering on Northumberland straits is becoming depleted, and some work must be done on the beds if the fishery is to be saved.

SWORDFISH

Swordfish were more plentiful along the coast, and larger catches were made than during the previous year. The landings for 1928 were 8,088 cwt., having a marketed value of \$132,345, as compared with a catch of 7,299 cwt. having a marketed value of \$120,692 last year. Good landings were made at Louisburg, Glace Bay, North Sydney and Petit de Grat. Heavier catches were also made in Guysboro county waters.

The following reports by districts will be of interest, showing the local conditions with respect to catches and values:—

DISTRICT NO. 1, CAPE BRETON—INSPECTOR MCLEOD

The outstanding features of the year, compared with 1927, are decreases in the quantities landed and values of lobsters, mackerel, halibut, salmon, pollock, and alewives; and increases in the quantities landed and values of cod, haddock, swordfish, herring, smelts and hake.

Lobsters.—The total catch was 40,403 cwt., marketed value, \$499,523, as compared with 42,524 cwt. with a marketed value of \$565,442 for 1927.

The largest catches were landed at Mainadieu, 3,006 cwt.; Port Hood Island, 2,070 cwt.; Petit de Grat, 1,827 cwt.; Port Morien, 2,344 cwt.; and Cheticamp, 1,682 cwt.

Cod.—The total catch was 153,780 cwt., marketed value \$343,755, as compared with 139,096 cwt. with a marketed value of \$292,061 for 1927. Increases compared with the preceding year are 14,684 cwt. in the catch and \$51,694 in landed value. On account of the low prices that prevailed for this fish during the previous year, the fishermen had no ambition to prosecute this branch of the industry at the opening of the season, as the price offered by fresh fish buyers was considered entirely too low. It was not until late in the season, when prices advanced, that the fishermen operated with any degree of vigour. However, cod were quite abundant during the whole season and the weather very favourable, except during October and November.

The largest catches were landed at North and South Ingonish, 23,832 cwt.; North Sydney, 33,685 cwt.; New Haven and Neil's Harbour, 14,873 cwt.; Petit de Grat, 12,658 cwt.; Cheticamp, 12,624 cwt.; Port Hood Island, 8,938 cwt.

Swordfish.—The total catch was 5,856 cwt., marketed value \$80,958, as compared with 5,376 cwt. with a marketed value of \$66,601 for 1927.

An increase of 480 cwt. in the catch, and 14,357 in the value is shown, as compared with the preceding year. The increase is due to the fish being more plentiful and weather conditions quite favourable. Increases were recorded at the ports of Fourchu, L'Ardoise, Gabarus, Petit de Grat, Louisburg, North Sydney and Ingonish.

Largest landings were as follows: Louisburg, 2,923 cwt.; Glace Bay, 1,120 cwt.; North Sydney, 768 cwt., and Petit de Grat, 520.

Haddock.—The total catch was 57,500 cwt., marketed value \$138,913, as compared with 68,344 cwt. with a marketed value of \$132,485 for 1927.

A decrease of 555 cwt. at L'Ardoise was due to the fact that none were caught in fish traps, as these fish kept farther off shore than usual, while at Petit de Grat an increase of 5,238 cwt. is noted, where most of the fish was caught in trap-nets. Louisburg shows an increase in the catch of 450 cwt. due to the fishermen of this port operating later in the fall than usual as a result of the better prices offered for the catch and improved transportation facilities, the Fisheries Branch having operated a Fish Collection Service on this section of the coast during the fall months.

An increase of 1,814 cwt. is shown at Ingonish, due to these fish being fairly plentiful in the spring when large catches were taken in the trap-nets at Middle Head. The fall run was not nearly as large as usual.

Mackerel.—The total catch was 27,810 cwt., marketed value \$103,613, as compared with 29,832 cwt. with a marketed value of \$122,425 for the 1927 season.

It is remarkable that the fall mackerel can be caught only with a jig in the district from Pleasant bay to Broad cove, on the northern coast of Inverness county, while on other sections of the Cape Breton island coast they are caught, principally, in gill-nets. Though fall mackerel in past years used to frequent the waters of Port Hood island, for some unaccountable reason they have not put in an appearance in any quantities for the past five or six years.

Halibut.—The total catch was 4,748 cwt., marketed value \$64,113, as compared with 4,772 cwt. with a marketed value of \$92,194 for the 1927 season.

The port of North Sydney shows an increase of 1,333 cwt., which is attributable to a larger number of bankers calling at this port for bait and disposing of their catch; also, more of the North Sydney fleet engaged in this branch of the industry during the spring months, owing to the good prices prevailing. On other sections of the coast, however, these fish were scarce, which accounts for the net decrease in the catch.

The largest landings were at North Sydney, 3,173 cwt., Hawkesbury, 247 cwt.; Scatarie, 201 cwt.; and Port Morien, 199 cwt.

Salmon.—The total catch was 2,498 cwt., marketed value \$39,922, as compared with 4,897 cwt. with a marketed value of \$78,436 for the 1927 season.

The decrease is due altogether to scarcity, as fine weather prevailed during the fishing season. From Pleasant bay to Broad cove, on the northern coast of Inverness county, a decrease of 953 cwts. is noted; from Inverness to Hawkesbury, a decrease of 193 cwt.; from Lingan to Point Aconi, a decrease of 25 cwt.; from Big Bras d'Or to Smoky, a decrease of 83 cwt.; from Ingonish to bay St. Lawrence, a decrease of 60 cwt. As a matter of fact this was the poorest season the salmon net fishermen have experienced for a great many years. In July fairly good catches were made by a few of the nets at Margaree and Broad cove, but at the same time the fishermen at Pleasant bay and Cheticamp ceased operating because of the small catches being taken. From Broad cove to Hawkesbury the fishermen scarcely paid expenses, but it is remarkable that a fisherman operating one net at Inverness made over \$900.

The largest catches were at Margaree, 394 cwt.; Little Loraine, 203 cwt.; Aspy bay, 159 cwt.; and Pleasant bay, 158 cwt.

Herring.—The total catch was 37,999 cwt., marketed value \$67,515, as compared with 26,604 cwt. with a marketed value of \$43,221, showing increases of 11,395 cwt. in the catch and 24,294 in value.

Largest landings were as follows: North Sydney, 11,540 cwt.; Hawkesbury, 3,790 cwt.; Petit de Grat, 2,251 cwt.; Cheticamp, 2,100 cwt.; Port Hood island, 1,686 cwt.; and St. Ann's, 1,620 cwt.

Smelts.—The total catch was 1,636 cwt., marketed value \$23,288, as compared with 1,727 cwt. with a marketed value of \$26,427 for 1927, showing decreases of 91 cwt. in the catch and \$3,139 in the marketed value.

Largest catches were as follows: Mabou Harbour, 296 cwt.; West Arichat, 150 cwt.; Louisdale, 144 cwt.; and Port Royal, 140 cwt.

Oysters.—The total catch was 1,265 bbl., marketed value \$9,230, as compared with 1,224 bbl. with a marketed value of \$10,347 for 1927, showing an increase of 41 barrels in the catch and a decrease of \$1,117 in the marketed value.

Hake and Cusk.—The total catch was 7,658 cwt., marketed value \$9,710, as compared with 3,663 cwt. with a marketed value of \$4,376 for 1927, showing an increase of 3,995 cwt. and \$5,334 in marketed value.

The increase in the catch is attributable to larger catches taken by the fishermen of Port Hood island and larger quantities landed by steam trawlers at Port Hawkesbury.

Largest landings were as follows: Port Hood island, 7,010 cwt.; Hawkesbury, 218 cwt.; Margaree harbour, 60 cwt.; and Cheticamp, 38 cwt.

Squid.—The total catch was 1,085 barrels, marketed value \$2,215, as compared with 684 barrels with a marketed value of \$2,977 for 1927, showing an increase of 80 cwt. in the catch and a decrease of \$762 in the marketed value.

Largest landings were as follows: Cheticamp, 700 barrels; Margaree harbour, 105 barrels; Grand Etang, 150 barrels; and Port Hood island, 25 barrels.

Flounders.—The total catch was 664 cwt., marketed value \$3,627, as compared with 1,846 cwt. with a marketed value of \$9,227, showing a decrease of 1,182 cwt. in the catch and \$5,600 in the marketed value. The entire catch was landed by trawlers at Port Hawkesbury.

Eels.—The total catch was 178 cwt., marketed value \$926, as compared with a nil catch and value for 1927. Nearly all these fish were landed at Louisdale.

DISTRICT NO. 2—COMPRISING THE COUNTIES OF HALIFAX, GUYSBORO, PICTOU,
COLCHESTER, CUMBERLAND AND HANTS—INSPECTOR SUTHERLAND

The total quantity of all varieties landed was 729,789 cwt., marketed value \$4,199,173, as compared with 692,072 cwt. in 1927 valued at \$4,010,258. This is an increase of about 10,000,000 pounds in the catch, with a corresponding increase in value of \$188,915. Heavier landings in Halifax county west are responsible for about 90 per cent of the increase and Guysboro county shows a slight increase. Somewhat larger catches were made in Cumberland county northwest and the Bay of Fundy section.

Of the varieties taken, cod and haddock have increased over 11,000,000 pounds, while the lobster catch is greater by about half a million. The most serious decreases are those of herring, 500,000 pounds, and salmon, about 200,000 pounds. The increased values are in part due to higher prices paid for ground fish than in the previous year. The prices offered for lobsters were considerably lower.

Cod.—The total catch was 276,013 cwt., with a marketed value of \$1,126,-858, as compared with a catch of 212,876 cwt. with a marketed value of \$930,038 for 1927, showing an increase of 63,137 cwt. in the catch and \$196,820 in the marketed value. However, as 35,800 cwt. of cod were brought into this district from outside points, the actual marketed value of the catch would be about \$71,600 less than the amount shown above, or about \$1,055,258.

The increased catch is due to Halifax county west, where 44,490 cwt. more were landed than in 1927, and Guysboro county, where the increase was about 20,000 cwt.

Of the total catch 112,379 cwt. were taken offshore, compared with 100,865 cwt. in 1927.

Prices were considerably better than during the previous year, and the fishermen between Halifax and Sonora had, by the collecting service, an opportunity to dispose of their catches in the fresh state. However, the prices for dried fish were so attractive that most of the fishermen in Halifax county east followed their usual custom and salted the catch.

Haddock.—The total catch was 241,502 cwt. with a marketed value of \$1,023,977, as compared with 191,934 cwt. with a marketed value of \$884,238 for 1927, showing an increase of 49,568 cwt. in the catch and \$139,739 in the marketed value. As in cod, considerable quantities of haddock were brought into this district, 12,168 cwt. in all, which would make the actual marketed value about \$24,336 less than that shown above, or about \$999,641.

The increase is due to heavier landings in Halifax county west, where the catch increased 48,103 cwt., while in Guysboro county east, due to fewer steam trawlers, the decrease was 3,986 cwt. Slight increases were also made in Halifax east and Guysboro west.

Of the total catch, 214,686 cwt. were taken offshore, as compared with 173,363 cwt. in 1927.

Hake and Cusk.—The total catch was 7,658 cwt. with a marketed value of \$23,143, as compared with 5,391 cwt. with a marketed value of \$12,955 for 1927. The increase is due to the Halifax county catch, which was 2,227 cwt. greater than in 1927, as 1,991 cwt. were taken offshore, as compared with 342 cwt. the previous year. Prices were as follows: Landed, \$0.75-\$1. Marketed—dried, \$5; green salted, \$3; smoked fillets, \$10-\$11; fresh fillets, \$10.

Pollock.—The total catch was 6,232 cwt. with a marketed value of \$12,709, as compared with 8,180 cwt. with a marketed value of \$12,694 for 1927, showing a decrease of 1,948 cwt. in the catch and an increase of \$15 in the marketed value. Of the catch, 4,507 cwt. were taken offshore, compared with 5,399 cwt. in 1927. Prices to the fishermen were \$1 and marketed price about the same as for hake.

Halibut.—The total catch was 7,051 cwt. with a marketed value of \$162,095, as compared with 7,240 cwt. with a marketed value of \$146,871 for 1927.

While the catch is about the same as for 1927, there is an increased marketed value of \$15,224. This is due in part to better prices, but mostly on account of 1,187 cwt. brought into this district. The offshore catch was 4,403 cwt., compared with 5,754 cwt. in 1927.

Large catches were made in Halifax county west and smaller catches in Guysboro east.

Herring.—The total catch was 50,241 with a marketed value of \$117,205, as compared with 54,609 cwt. with a marketed value of \$163,140 for 1927.

The catch is the smallest for the past five years. There was a general scarcity of spring and summer herring on the Atlantic coast of this district, but in October a heavy run entered Halifax bay and the western coast waters of Halifax county, where substantial catches were made by the fishermen. Bait was scarce throughout the season, which was a great hardship to the fishermen.

Mackerel.—The total catch was 29,582 cwt. with a marketed value of \$170,201, as compared with 34,003 cwt. with a marketed value of \$160,908 for 1927, showing a decrease of 4,421 cwt. in the catch and an increase of \$9,293 in the marketed value. This is the smallest catch for the past seven years, and the decrease most pronounced in Guysboro county, where 13,216 cwt. less were taken than in 1927; while in Halifax county west these fish were more plentiful, 17,962 cwt. being taken, as compared with 8,125 cwt. in 1927.

Prices to the fishermen were more satisfactory than in other years. Market prices were: \$8, fresh; \$8.50-\$9, salt (spring); \$18-\$20, salt (fall).

Salmon.—The total catch was 3,676 cwt. with a marketed value of \$77,374, as compared with 5,886 cwt. with a marketed value of \$113,971 for the 1927 season.

The decrease was general, excepting in the bay of Fundy, where there was a considerable increase. Antigonish and Pictou county east, where there is a valuable trap-net fishery, suffered the most, the catch falling off 50 per cent or 1,655 cwt. and \$14,207 in value. As the fish were scarce, the fishermen enjoyed the highest prices for some years past.

Albacore.—The total catch was 875 cwt. with a marketed value of \$8,750, as compared with 1,575 cwt. with a marketed value of \$15,750 for 1927.

This fishery is confined to St. Margaret's bay where albacore are taken by trap-nets and harpooning. The catch for 1928 is about an average, although it shows a considerable decrease from 1927, which was the largest catch since 1923.

Swordfish.—The total catch was 2,100 cwt. with a marketed value of \$49,429, as compared with 1,715 cwt. with a marketed value of \$30,795 for 1927, showing an increase in the catch of 385 cwt. and \$18,634 in the marketed value. This is due in part to shipments of 797 cwt. brought into this district. Heavier catches were made in Guysboro county.

Flounders, Skate and Soles.—Flounders decreased 5,135 cwt., while soles increased 1,743 cwt., the catches being 1,187 and 14,180 cwt., respectively. All of the latter were taken offshore, and 727 cwt. of flounders. The catch of skate was 2,163 cwt., as compared with 7,011 cwt. in 1927. However, this does not include large quantities of skate landed by steam trawlers at Halifax for reduction purposes.

DISTRICT NO. 3—COMPRISING THE COUNTIES OF LUNENBURG, QUEENS, SHELBURNE, YARMOUTH, DIGBY, ANNAPOLIS AND KINGS—INSPECTOR MARSHALL.

The total amount of all kinds of fish for the year was 1,538,476 cwt. and 40,720 barrels of shellfish, with a total marketed value of \$5,970,206, as compared with 1,481,730 cwt. valued at \$5,300,749, which shows an increase of 56,746 cwt., and an increase in value of \$669,457.

Cod.—The catch of cod was 1,040,379 cwt. valued at \$2,927,406, as compared with 979,901 cwt. valued at \$2,233,673 for 1927. This shows an increase of 60,478 cwt. with an increase in value of \$693,733 for the year 1928.

Haddock.—This fishery shows an increase of 23,019 cwt., and an increase in value of \$106,675 over the preceding season.

Hake and Cusk.—A decided increase is shown of 33,051 cwt., and value of \$99,215.

Halibut.—The season was not as successful as last season, as a decrease is shown in catch and value of 1,570 cwt. and \$22,239.

Herring.—The catch of herring was 78,158 cwt. with a marketed value of \$183,501, as compared with 133,347 cwt. valued at \$276,047 for 1927. This shows a decrease of 55,189 cwt., and a decrease in value of \$92,547.

Mackerel.—This fishery shows an increase of 5,577 cwt. and an increase in marketed value of \$40,420.

Salmon.—The catch of salmon for 1928 was 885 cwt. with a value of \$21,385, as compared with 2,036 cwt. valued at \$40,782 for the season of 1927, showing a decided decrease of 1,151 cwt. and a decrease in value of \$19,397.

Scallops.—This fishery shows a decrease of 13,046 barrels, and a decrease in value of \$56,510.

Loabster.—This fishery shows a decrease in the catch of 9,921 cwt., and a decrease in the value of \$106,790.

BAIT REPORTING SERVICE

Most of the vessels engaged in the fishing industry of the province are now equipped with radio sets. A new wireless broadcasting service was inaugurated last April for the purpose of furnishing the fishermen and others interested in the industry with information in connection with the following items:—

1. Weather reports.
2. Bait reports daily from the Magdalen Islands, Canso, Port Hawkesbury, North Sydney, Halifax, Lunenburg, Liverpool, Lockport, Shelburne, Yarmouth, Queensport, Port Hood, and other points, showing the quantity of frozen bait in storage and the quantity of fresh unfrozen bait available as well as the ice supplies on hand.
3. Ice conditions prevailing along the coast.
4. Prevailing local prices of dried fish.
5. Prevailing local prices for slack salted fish, including, where possible, Boston and Gloucester quotations.
6. New items covering catches of vessels arriving from the banks, and any outstanding fishery incidents such as loss of life, or damage or loss of vessels, or other unusual events that would be of interest to the fishermen, including urgent information as to the families of the fishermen.

The information involved was collected and compiled by the Halifax office, and was broadcast twice daily from the Louisburg Marconi Station and the Halifax Lightship. Many favourable comments have been received on the ser-

vice, and it is considered a distinct step in the right direction. The general opinion is that it has been of great advantage to the fishermen and the fishing industry as a whole. The service will undoubtedly become more popular and beneficial as time goes on and better and more receiving sets are installed on the vessels.

The first broadcast message was sent forward on April 23, and the service was discontinued for the season on November 30.

THE STEAM TRAWLER

During 1928 eleven trawlers operated from this province, while in 1927 fourteen were employed. The trawlers operating in 1928 are as shown below:—

Name of Vessel	Port Operated from	Time engaged
<i>Venosta</i>	Halifax.....	January-December
<i>Lemberg</i>	".....	"
<i>Good Hope</i>	".....	"
<i>Vienoë</i>	".....	"
<i>Cape Agulhas</i>	".....	January-April
<i>St. Cuthbert</i>	".....	November-December
<i>Loubyrne</i>	Halifax and Port Hawkesbury	November-December
<i>Rayon d'Or</i>	Canso.....	January-December
<i>Bonthorpe</i>	".....	January-May 1st
<i>Stearford</i>	".....	"
<i>Offa</i>	".....	January-March

In addition, the baby trawler *Geraldine* was built at Lunenburg, and operated from that port from June 30 for the Lunenburg Sea Products and Cold Storage Company, Limited. Her dimensions are: length, 108 feet; beam, 28 feet; draught, 10 feet, and she is equipped with crude oil engines having a motive power of 200 horse-power.

INTRODUCTION OF THE DANISH SEINER

An interesting experiment was made when the Nova Fisheries Limited, of Halifax, equipped a vessel, the *Nova I*, for Danish seining. She was constructed at Mahone Bay, N.S., and her dimensions are: length, 61 feet; beam, 17·6 feet; draft, 9 feet; hold, 8½ feet. She was powered with a 50-horsepower Diesel engine and equipped with a Danish seine hauler.

This was an introduction of an entirely new method of fishing in these waters. The *Geraldine* left on her first trip on November 1, but was handicapped in her operations by extremely bad weather. Her operations, in more moderate weather, will be watched with interest.

THE LUNENBURG FLEET

The year 1928 brought success to the Lunenburg fleet and in many instances records were eclipsed. The value of the deep-sea catch registered an increase of half a million dollars over the catch of the previous year.

From a financial standpoint the year may be considered as a distinct success. While last year eighty-three vessels were operated, this year the number was seventy-five. The decrease in the number of vessels in commission was eight although the monetary gain was outstanding over the year 1927.

Better prices prevailed than last year. The fish from the frozen bait trip were cured and sold at \$7.50 per quintal, a considerable advance over the price received from that trip last year.

Sixty-nine vessels participated in the second trip and their catch sold for \$8 per quintal. The vessels on these two trips were handicapped by extremely rough weather, resulting in decreased fares.

Fine weather prevailed for the most part during the summer trip, and good catches were made. The catch was sold two months earlier than in the previous year and brought \$9 per quintal.

Two vessels, the *J. H. Sinclair* and the *J. W. Margeson* were lost at the beginning of the summer trip. On the fall trip the *Andrava* was sunk in collision at Sydney Harbour. The crews fortunately, in all three cases, were saved. During the earlier trips quite a few vessels suffered damage due to prevailing rough weather, but the losses were comparatively slight, compared to former years.

Encouraged by good prices, and ready markets, eighteen vessels sailed on the fall trip. The fall trip is not a general one, but the results were encouraging, as the catch was good and the prevailing prices much in advance of previous years.

Each year shows an increased number of Newfoundland fishermen manning the Lunenburg fleet, and the year under review was no exception. A number of vessels during the past few years have been manned almost entirely by men from the ancient colony.

Practically the whole fleet is equipped with radio, and the broadcast service in connection with the bait and ice reports was very favourably commented upon by various captains interviewed.

The captains and fishermen, as a whole, were loud in their praise of the valuable service rendered by the C.G.S. *Arras* as a hospital ship on the banks.

DESTRUCTION OF HAIR SEALS

In view of the harmful activities of hair seals, especially to the salmon and smelt fisheries, the Fisheries Branch decided last year to pay a bounty of \$3.50 for each seal destroyed, on production of proper evidence of destruction. The bounty was repeated this year, but was discontinued in July, as the number of bounty claims received was so great that the amount provided by Parliament for bounty became exhausted. The amount expended in Nova Scotia until the end of July was \$10,570. This represents a destruction of 3,020 seals.

If funds had been available for the continuation of the bounty, naturally a great many more seals would have been destroyed. The best months for killing are June, July and August. It should be understood that a great many seals are destroyed on which no bounty is paid. It is impossible to estimate the number, but probably ten per cent of the seals killed are lost before the bodies can be recovered to secure the snouts which must be presented as evidence of destruction by the persons claiming the bounty.

More claims were paid in western Nova Scotia than in any other section of the province. The western counties of the mainland accounted for 1,345 claims, eastern counties for 1,190 claims, and the Island of Cape Breton for 485.

A great many hair seals are procurable in this province, and it is in the interest of the fishermen that they be destroyed, owing to their destructive tendencies towards the valuable salmon and smelt fisheries. If a good market for the skins can be secured, at an attractive price, the destruction will naturally be larger. Up to the present, it appears that a great many of the fishermen destroying seals have not saved the skins. This procedure will undoubtedly be corrected if the fishermen and others killing seals can be assured of a ready paying market for the skins.

FISH COLLECTION SERVICE

A Fish Collection Service was inaugurated and was put in operation along the southern shore of Cape Breton Island, between Main-a-dieu and Fourchu. The ss. *Mary Patricia* began operating on August 27, the *Pearl Cann* on August

28, the *Pollyanna* on October 11, and the *Comfort 2nd* on October 19. The *Mary Patricia* ceased operating on January 1, the *Pearl Cann* on December 3. the *Comfort 2nd* on January 6, and the *Pollyanna* on December 18.

The *Pollyana* collected fish at Main-a-dieu, Big and Little Lorraine, and the *Comfort 2nd* collected fish at Fourchu and Gabarus, both boats conveying their cargoes to Louisburg where they were transferred to the *Mary Patricia* and *Pearl Cann*. The *Mary Patricia* and *Pearl Cann* plied direct between Louisburg and Canso, conveying the cargoes transferred from the *Pollyanna* and *Comfort 2nd* as well as the catch taken by the fishermen at Louisburg.

The following is a statement of the weight of fish taken at the several ports:—

Main-a-dieu	Louisburg	Gabarus	Fourchu	Big Lorraine	Little Lorraine
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
67,664	434,238	20,922	72,272	36,147	84,660

The fishermen along this section of the coast greatly appreciated the efforts put forth by the Fisheries Branch to give them better transportation facilities. Had it not been for this service the catch would have been less than half as large, for in the past fishermen ceased operating early in the fall on account of the poor prices prevailing and no boats to convey their catches to market. The weather was very stormy during the months of October and November, which greatly interfered with fishing operations. Had the weather been fine the catch would have been doubled.

The collection service which was inaugurated on the eastern part of the mainland in 1927, between Port Bickerton and Canso, was continued successfully in 1928. A new service was started between Sonora and Halifax.

The two collection services in eastern Nova Scotia carried a total of 4,262,053 pounds.

In western Nova Scotia a collection service was inaugurated, operating between Port LaTour, Shelburne and Lockport.

RIVER AND INLAND FISHERIES

Nova Scotia is famous for its sport fishing rivers and lakes, and more and more tourists are being attracted to the province every year on account of the splendid angling opportunities which prevail. Of course, the sport is also extensively engaged in by citizens of the province. It is absolutely essential that our salmon and trout be afforded all protection possible, and every effort is being made in this direction. The salmon and trout fisheries are a distinct asset to the province, from an economic standpoint, and attract many visitors.

A number of fish and game protective associations have been organized in various sections amongst the local sportsmen for the purpose of affording all protection possible to our game fish. Our own officers have been zealous in their efforts to prevent illegal fishing.

The Margaree river was visited by a larger number of tourists than ever before. The largest salmon caught on the rod weighed thirty-two pounds, and the largest number taken by a visiting angler was twenty-seven. The largest salmon landed by an angler in the Margaree river last year weighed 52½ pounds.

On the Cheticamp river twenty-eight salmon were landed by a visiting angler, and curiously enough the largest fish weighed twenty-eight pounds.

The salmon angling yield in these two rivers for the last four years has been as follows:—

Year	Margaree River	Cheticamp River
1925.....	363	69
1926.....	489	100
1927.....	868	138
1928.....	509	121

On the Maccan river, Cumberland county, an unusual feature occurred in a heavy run of small salmon which took place in late July. This river usually supports a good run of spawn fish in September and later, but this year the salmon referred to were in the river in good condition until the latter part of August. The water was not high at the time, and it was only by the best efforts of the officers that large numbers were not destroyed by poachers. A number were taken by sport fishing with dry flies. The fact that salmon were plentiful in the headwaters of the bay of Fundy may explain this unusual run.

No salmon fly fishing is done in Colchester, Pictou, and Antigonish counties. In Guysboro county and Halifax county, due to the failure of the salmon on the coast, comparatively few entered the rivers and the sport catch was not up to normal.

During the early part of the season trout were fairly plentiful in the Margaree river. The largest trout of which there is departmental record was captured on May 19 at Long Marsh pool, Margaree river. It weighed, when landed, 6 $\frac{3}{4}$ pounds. It was 26 $\frac{1}{2}$ inches long, with a girth of 14 $\frac{1}{2}$ inches.

Very satisfactory catches were taken in lake Ainslie, Indian river, and river Denys, Inverness county, and Baddeck and Washabuck rivers, North Aspy river, Middle river, Clyburn's brook, and Ingonish river, Victoria county, during the early part of the season, but in July, August, and September very few were caught on account of the waters being very low and warm. In Bentinek pool, Baddeck river, fifteen trout were taken, weighing from two to four and a half pounds, in one day.

Angling in western Nova Scotia for both salmon and trout was good. An increased number of non-resident anglers visited the district. The Mersey river, Medway river, Tusket river, Annapolis river, etc., provided good sport for the anglers. The salmon fishery on the Mersey river is reported to be increasing fast, and if the new development being carried on by the Nova Scotia Power Commission on this river does not interfere too much with the ascent of salmon the fishery should continue to increase.

ERECTION OF HALIFAX COLD STORAGE PLANT

For many years past there has been a general demand for the establishment of adequate cold storage facilities at the port of Halifax. This year saw the commencement of the erection of a modern cold storage plant to meet that demand. In April, 1929, a plant costing two and a quarter million dollars will be completed at Halifax.

While the plant will handle all kinds of perishable foods, one large unit is to be devoted exclusively to the handling of fish. The facilities will be available to the public, and in the cold storage chambers there is ample storage room for holding frozen fish. The equipment includes the rapid brine freezing process—Bird's Eye method. The establishment of this plant should be of great benefit to those engaged in the fishing industry. It will undoubtedly be helpful to the shore fishermen.

The plant is known as the Nova Scotia Public Cold Storage Terminals, Limited, and is located advantageously at the south end terminals. With the facilities provided, it is to be expected that fishery production will increase.

FISHERMEN'S CO-OPERATIVE ASSOCIATIONS

During the year twenty-nine Fishermen's Co-operative Associations were operated throughout the province. They were confined to the eastern mainland and the island of Cape Breton. The number will likely be considerably increased from year to year and stations organized in the western part of the province.

The co-operative associations, or stations, of the Fishermen's Federation of Nova Scotia operated during the year under review were located at the following points:—

1. Canso, Guysboro county.
2. Petit de Grat, Richmond county.
3. Arichat, Richmond county.
4. Porierville, Richmond county.
5. West L'Ardoise, Richmond county.
6. Lower L'Ardoise, Richmond county.
7. Rockdale, Richmond county.
8. L'Ardoise, Richmond county.
9. L'Ardoise, Richmond county.
10. Lismore, Pictou county.
11. Fourchu, Richmond county.
12. Gabarus, Richmond county.
13. Louisburg, Cape Breton county.
14. Main-a-dieu, Cape Breton county.
15. Havre Boucher, Antigonish county.
16. Ingonish Beach, Victoria county.
17. Big Island, Pictou county.
18. Arisaig, Antigonish county.
19. Monk's Head, Antigonish county.
20. River John, Pictou county.
21. Grand Etang, Inverness county.
22. Dover, Guysboro county.
23. Margaree, Inverness county.
24. Belle Cote, Inverness county.
25. Whitehead, Guysboro county.
26. Port Felix, Guysboro county.
27. Cole Harbour, Guysboro county.
28. Little Lorraine, Cape Breton county.
29. Port Hood Island, Inverness county.

Each station elected officers such as president, vice-president and secretary-treasurer, and an executive committee. The number of members belonging to each station ranged from fifteen to one hundred and thirty-six, and the number of meetings held by each organization from one to twenty-five.

The various associations referred to were organized primarily for the following objects:—

(a) To procure information respecting the latest improvements in boats and fishing gear of all kinds, methods of curing and preparing fish for markets, and the transportation and marketing of fish and fish products.

(b) To co-operate in the matter of purchases of fish, fishing supplies and accessories and in the canning, curing, storage, preservation, selling, marketing and export of fish.

(c) Mutual communication between the stations of such information.

(d) To take action upon matters arising in respect to the fisheries and to make representations and furnish information to the proper authorities.

(e) Generally to improve and elevate the material, intellectual and social welfare and standing of the members.

UTILIZATION OF FISH WASTE AND MANUFACTURE OF BY-PRODUCTS

There was one less licensed reduction plant operated in the eastern part of the province during the year under review than last year.

During the year three licensed reduction plants operated in the eastern portion of the mainland, as shown below:—

1. FASTERFAT LIMITED, HALIFAX.
2. KENDALL REDUCTION WORKS AND FISH MEAL PLANT, HALIFAX.
3. ROBINSON GLUE COMPANY, CANSO.

The following licensed reduction plants were operated in western Nova Scotia:—

1. H. R. L. BILL, LOCKEPORT.
2. A. W. DODD, FREEPORT.
3. A. W. DODD, WESTPORT.
4. ROY CASEY, VICTORIA BEACH.
5. PARKHURST COD LIVER OIL CORPORATION, TIVERTON.
6. M. A. NICKERSON, CLARK'S HARBOUR.
7. W. H. GOUDY, LOCKEPORT.
8. H. WALL, YARMOUTH.
9. YARMOUTH MEAL AND OIL COMPANY, LIMITED, YARMOUTH.
10. LEWIS CANNING COMPANY, ANNAPOLIS.

The Lewis Canning Company was operated from a by-product standpoint for the purpose of grinding scallop and clam shells into chicken feed. The other concerns mentioned in western Nova Scotia were engaged in the production of oil.

FISHERIES PATROL SERVICE

The patrol boat *Mildred McColl* made her first patrol this year on April 7, after the usual overhauling, and patrolled the lobster districts in Halifax, Guysboro, and along Northumberland straits until the seasons opened. This boat did very effective work in regulating the opening of the season in the straits district by enforcing the opening hour and thus giving all fishermen an equal chance for the best grounds. This has always been a bone of contention with the lobster fishermen there, and led to many disputes in former years, when weather conditions permitted the running of lines on the opening day. Fishermen and packers, generally, appreciated the enforcement this year.

Until July 21 the *Mildred McColl* was engaged in regular patrol work in Halifax and Guysboro counties, when she was taken for scallop investigation work to Prince Edward Island and other points. She was engaged in this work until August 21, and then returned to regular patrol work, and remained in commission until January 31.

The work performed by this boat was most valuable for the proper regulation and protection of the fisheries. Captain Williams, and his crew, were most efficient and conscientious. During the absence of the *Mildred McColl* from regular patrol work, illegal fishing broke out in some sections.

The contract boat *Lulu T.*, was again engaged for the protection of the lobster boundary line at Port Philip and the closed area east of the boundary.

Captain Brownell was employed as master, and the inspector for the district reports the protection of the lobster grounds in the close season this year was most satisfactory.

The *F.P.I.* carried on satisfactory and continuous patrol throughout the season from Pubnico, Yarmouth county, to the head of the bay of Fundy.

FISHERIES CRUISER SERVICE

Both C.G.S. *Arras* and C.G.S. *Arleux* were busily occupied throughout the year. The commanding officers, Captain Barkhouse, of the *Arras*, and Captain Cousins, of the *Arleux*, deserve praise for the splendid work carried out by the vessels under their command.

The *Arras* in addition to carrying on regular patrol work along the coast during the spring, fall and winter, again proceeded to the Grand Banks as a hospital ship, with the fishing fleet, and remained on that duty during the summer. The services rendered in this connection were much appreciated by the fleet, but a boat with larger and better accommodation for hospital cases is desirable and it is hoped that such may be secured in the near future. The *Arras*, however, gave every assistance possible to the fleet, and many expressions of appreciation have been received with regard to her work.

Dr. D. R. Webster, who was employed on the vessel, reports with regard to the work on the banks as a hospital ship, as follows:—

"The season was no doubt the most successful from every viewpoint. The medical service was the largest yet experienced due in a measure to a more or less severe epidemic of influenza among the crews of the vessels. There were no deaths from illness among the fleet. The following is a summary of the work:—

Total number of new cases.....	303
Total number of calls.....	378
Total number of minor operations.....	65
Patients conveyed to St. John's or other port for home or hospital..	12 "

The *Arleux* was actively engaged in patrol work throughout the year, and was instrumental in clearing many harbours of ice during the winter months. Her services were most valuable, and were much appreciated by the fishing industry. As in recent years, she acted as a mother ship to the fishing fleets of Canso, Arichat, Petit de Grat and vicinity, rendering them any assistance necessary.

LOSS OF LIFE

With deep regret there is reported the death of Mr. Thomas Burke of Bateston, Cape Breton county, who was drowned in Mira bay, Cape Breton, on May 10, while in the act of setting a herring net, and also that three fishermen were lost in eastern Nova Scotia, two in Guysboro east and one in Antigonish county.

LICENSES ISSUED

Lobster fishing.....	8,586
Lobster packing.....	112
Lobster packing extension.....	134
Lobster pound.....	17
Salmon gill-net or drift-net.....	750
Salmon trap-net, pound-net or weir.....	399
Salmon net permits.....	40
Smelt gill-net.....	534
Smelt bag-net.....	252
Herring weir.....	79
Drag seine.....	132
Oyster.....	281
Scallop.....	196
Reduction works.....	13
Trap-net.....	264
Cannery.....	21
Shad gill-net or drift-net.....	9
Quahaug.....	2
Angling permits.....	950
Certificates F. 12.....	313

PROSECUTIONS

There were seventy-nine prosecutions for violations of the Fishery Regulations. Thirteen took place in Nova Scotia, District No. 1, forty-two in Nova Scotia, District No. 2, and twenty-four in Nova Scotia, District No. 3. Statements showing details in connection with the prosecutions referred to appear as part of Appendix No. .

REPORT OF SUPERVISOR S. T. GALLANT, PROVINCE OF PRINCE EDWARD ISLAND AND MAGDALEN ISLANDS, FOR 1928-29

The total marketed value of the fisheries of Prince Edward Island for the year 1928 was \$1,196,681. The following table gives the comparison between the catch and value for the year 1928 and that of 1927:—

Kinds of fish		1927		1928	
		Quantity caught	Value marketed	Quantity caught	Value marketed
Cod.....	cwt.	49,419	\$ 128,830	36,852	\$ 98,028
Haddock.....	"	1,168	3,787	996	4,254
Hake and cusk.....	"	11,326	16,780	11,925	23,162
Herring.....	"	51,834	88,368	47,451	94,539
Mackerel.....	"	6,455	28,255	10,197	42,068
Alewives.....	bbl.			150	450
Salmon.....	cwt.	124	3,031	55	1,375
Smelts.....	"	14,936	179,232	13,122	112,319
Trout.....	"	61	646	92	1,104
Caplin.....	bbl.	183	850	178	682
Eels.....	cwt.	131	1,358	245	2,390
Tom cod.....	"	1,823	4,195	1,936	5,870
Clams and quahaugs.....	bbl.	1,174	5,760	2,549	6,167
Crabs.....	cwt.	135	360	523	1,248
Lobsters and products.....	"	62,800	855,917	65,613	*752,123
Scallops.....	bbl.	96	240	320	1,395
Oysters.....	"	4,071	48,838	4,756	47,619
Tongues and sounds.....	cwt.	68	1,360		
Seals.....	no.			415	1,488

*Some lobsters shipped to New Brunswick and Nova Scotia and marketed value included in returns for those provinces.

COD

There was a decrease of 12,567 cwt. in the catch of cod. The catch by counties follows:—

West Prince.....	9,878 cwt.
East Prince.....	807 "
Queens.....	20,274 "
Kings.....	5,893 "

HADDOCK

The catch by counties follows:—

Kings.....	846 cwt.
Queens.....	150 "

HERRING

There was a decrease of 4,383 cwt. in the catch of herring. As the fish caught in the spring season was of very poor quality it was in demand only for lobster bait and fox food. The catch by counties follows:—

West Prince.....	17,930 cwt.
East Prince.....	6,033 "
Queens.....	7,364 "
Kings.....	16,124 "

LOBSTERS

Lobster fishing became general the first week of May and was fairly good during the entire month, but there was a decided falling off in June. The price per case was lower than last year. In the late season area, however, there was quite an increase in the catch, so that the season, on the whole, shows an increase of 2,813 cwt. The catch by counties follows:—

West Prince.....	14,534 cwt.
East Prince.....	12,342 "
Queens.....	11,096 "
Kings.....	27,641 "

At the first of the season in the late season district \$18 per cwt. was paid for live lobsters of nine inches and over, but during a period of warm weather, extending from August 16 to September 1, the price declined to \$12 per cwt.

OYSTERS

Again this year the bulk of the catch was taken from Vernon, Orwell, Seal, East and West rivers and tributaries. Weather conditions during the summer were especially favourable and the oysters grew rapidly. So large a catch was taken in the month of October that the market became glutted early in November and fishermen were obliged to cease operations. Otherwise, there would have been a large increase in the catch. The catch by counties follows:—

Queens.....	4,680 bbls.
Kings.....	17 "
East Prince.....	59 "

During the season a beginning was made to clean some of the oyster areas in Richmond bay, and seventy barrels of parent oysters were taken from East river and placed there. This should have a tendency to increase the number of spat and help propagation all over the bay. Last year some nine barrels were taken in Bideford river, a tributary to Richmond bay; this year thirty barrels were taken.

There was a tremendous set of spat in Percival river in the years 1927 and 1928, and in the near future it is hoped that this river will be as productive as in former years. A large quantity of these immature oysters were removed from shallow to deeper water in the bay and this should afford them ample opportunity to develop.

SMEELTS

There was a decrease of 1,814 cwt. in the smelt catch. The season for gill-net fishing opened on October 15, and for bag-net fishing on December 1. Fish were scarce throughout the entire season; they were in good demand, however, on the Boston and New York markets and good prices were obtained. The catch by counties follows:—

West Prince.....	1,228 cwt.
East Prince.....	4,429 "
Queens.....	7,073 "
Kings.....	392 "

CLAMS AND QUAAUGS

In clams and quahaugs there was an increase in the catch of 1,375 cwt. over that of last year. During the season a firm in Charlottetown canned a quantity of quahaugs which found a ready market at remunerative prices.

FISHERIES PROTECTION SERVICE

During the season of 1928 there were six patrol boats in the Protective Service, and with their aid and that of the overseers and guardians a great many attempts at illegal fishing were successfully suppressed; in fact, illegal lobster fishing was kept down to a minimum for the first time in a number of years.

The total number of confiscations for violations of the Fisheries Regulations during season 1928, covering 92 seizures, was 44.

The total number of prosecutions was 20.

REMARKS

The fishways at Laird's, Campbell's, Dixon's and Vernon river mill-dams were in good condition for the fall run of trout which ascend the head of the streams to deposit their eggs on the natural spawning grounds. There are eighty-eight mill-ponds throughout the province and all are teeming with brook trout.

CAPITAL AND EMPLOYMENT

The total capital invested was \$940,944, which covers sail and row boats, gasolene boats, carrying smacks, gill-nets, trap and smelt nets, tubs of trawls, hand-lines, lobster traps, fishing piers and wharves, ice-houses, small fish and smoke houses, and lobster canneries.

The number of females employed was 640; the number of males 2,967.

MAGDALEN ISLANDS

The total marketed value of the fisheries of the Magdalen Islands for the year 1928 was \$644,350, as compared with \$722,105 for 1927 a decrease of \$77,755, due principally to a failure in the mackerel and seal catch. Some fish was shipped to New Brunswick and its marketed value is included with the total for that province.

The following table gives a comparison of the catch and value for 1927 and 1928:—

Kinds of Fish		1927		1928	
		Quantity caught	Value marketed	Quantity caught	Value* marketed
Cod.....	cwt.	38,894	83,238	66,000	154,016
Herring.....	"	110,217	69,535	109,572	99,087
Mackerel.....	"	61,885	177,046	20,820	69,348
Smelts.....	"	80	240	163	968
Eels.....	"	50	350	70	490
Clams and quahaugs.....	bbls.	1,615	9,690	2,775	16,650
Lobsters.....	cwt.	20,463	300,087	22,227	292,207
Tongues and sounds.....	"	35	245		
Hair seals.....	no.	50,357	56,462	1,654	3,413
Seal oil.....	gal.	63,030	21,314	4,984	1,815
Cod oil.....	"	6,340	2,653	7,365	3,681
Fish skins.....	cwt.	284	639	100	275
Fish fertilizer.....	tons	24	606	50	1,000
Halibut.....	cwt.			250	1,400
Seal skins.....	no.			1,654	3,413

*Some fish was shipped to New Brunswick and Nova Scotia and the marketed value is included in returns for those provinces.

COD

This fish was in good demand, and there was an increase in the catch of 27,106 cwt., with an increase in value of \$71,806.

HERRING

There was a small decrease in the catch of herring with an increase in value, due, no doubt, to the large quantity of smoked fish. The smoking of herring is continuously expanding in the Magdalen Islands, four additional large smokers having been built at Grindstone and Etang du Nord. The Magdalen firms appear to have a ready sale for these fish, and this industry is progressing favourably.

LOBSTERS

There was an increase in the lobster catch of 1,764 cwt., with a decrease in value of \$7,880. Some lobsters were shipped to Nova Scotia and their marketed value was included with the figures for that province. There is very little variation in the catch of lobsters from year to year, but, if anything, it is on the increase. The people of these islands are law-abiding and no illegalities of any kind occur. The lobster canneries are equipped with the most modern facilities and turn out a first-class product.

In the Magdalen Islands there is a lobster sanctuary known as "The Lagoons", which is some twenty-eight miles in length and ranges in width from one-quarter of a mile to two miles. No lobster fishing is allowed in these lagoons. This might account for the steady catch of lobsters from year to year on these islands.

MACKEREL

The run of mackerel was small in comparison with 1927, and there was a decrease of 41,065 cwt. This gave the fishermen a better opportunity of taking care of the catch and as a result a superior quality of fish was put up.

SEALS

There was a decrease in the catch of 48,703 seals.

REMARKS

Navigation opened on April 16, which was much earlier than usual. SS. *Lovatt* continues to give entire satisfaction so far as passengers and freight are concerned; the captain and crew are very obliging and attentive to their duties which makes the boat especially pleasant for the passenger service.

REPORT OF SUPERVISOR J. F. CALDER, DISTRICT NO. 1, NEW BRUNSWICK, FOR 1928-29

District No. 1, New Brunswick, is made up of the counties of Charlotte, St. John, and Albert, and the Bay of Fundy watershed of Westmorland county.

The following statement shows the catches and marketed values for the past year:—

		Catch	Marketed value
Cod.....	cwt.	22,158	\$ 63,917
Haddock.....	"	28,164	63,110
Hake.....	"	68,160	53,929
Pollock.....	"	34,118	55,297
Halibut.....	"	66	.....
		marketed elsewhere	
Flounders.....	"	976	2,862
Skate.....	"	142	190
Herring.....	"	160,312	223,283
Sardines.....	bbl.	279,349	1,284,771
Alewives.....	cwt.	21,505	35,280
Salmon.....	"	2,500	56,051
Shad.....	"	2,388	27,861
Smelts.....	"	365	5,467
Clams.....	bbl.	23,121	96,383
Cockles.....	cwt.	59	183
Lobsters.....	"	7,177	149,537
Scallops.....	bbl.	50	250
Winkles.....	cwt.	308	891
Dulse, dried.....	"	2,450	3,629
Hair seals.....	no.	250	875
Tongues and sounds.....	cwt.	288	1,166
Fish oil, n.e.s.....	gal.	21,005	11,780
Fish fertilizer.....	ton	98	1,180
Fish skins and bones.....	cwt.	138	296
Other products.....			672

The marketed value of the catch for 1928 was \$2,138,860, as against \$1,858,-364 for last year, an increase of \$280,496, but, at the same time, slightly less than the value of the yield in 1926 and 1925, and considerably less than the total for 1924.

COD

The catch of cod was 22,158 cwts. as against 19,331 cwts. for the previous year. The value of the catch marketed was \$63,917. Most of the cod are taken in the late spring and summer months, when they are in prime condition.

HADDOCK

A very slight decline is to be noted in the haddock catch, as compared with the previous year—28,164 cwts. were taken during the present year, as against 29,735 cwts. in 1927. The average price paid for these fish was \$1.88 per cwt., which is practically the same as the average value for the previous year. However, an unfortunate feature in connection with the disposal of the catches by the fisherman is the fact that during the early summer months, when these fish were fairly plentiful and when the weather was very favourable for fishing operations, the price was down to \$1.25 per cwt. In the fall of the year, when the weather was very unfavourable for operations, the prices ranged from \$2.50 to \$4 per cwt.

HAKE

A large increase is to be noted in the catch of hake for the present year—68,160 cwts., as against 36,796 cwts. for 1927. There was a slight increase in the prices obtained.

POLLOCK

The catch of pollock was 34,118 cwt., as against 7,693 cwt. for the previous year. This increase was very gratifying as the fishermen had been afraid in recent years that the pollock fishery would become an absolute failure. The majority of the fishermen salt and dry their own catches, which were sold at very good prices. The fall run of pollock around the islands of Charlotte county are wonderfully fat fish, with very large livers. There was a ready market for fish livers at a price of about 50 cents per bucket. The liver of the individual pollock brought about five cents.

FLOUNDERS

About the usual small quantity of flounders—976 cwt.—were taken. These fish are either captured by spearing or by the use of hoop-nets. The small catch really represents the limited demand for these fish in the domestic market. There is, however, a heavy demand for flounders, at good paying prices, in the United States markets during the winter months. Some six or seven sail of American flounder dragners operated off the city of Eastport, Maine, during the latter part of 1928 and the first of 1929, and did exceptionally well. At the present time our Fishery Regulations prohibit the use of the kind of gear used by the American flounder dragners.

HERRING

The herring catch was again light in 1928, although there was a slight increase over the previous year, the catch for 1927 being 151,352 cwt., as against 160,312 cwt. during 1928. The decline in the herring fishery during the past two years is due to the very light run of large herring around Grand Manan island. While the catch was light again this year, good prices were obtained for smoked herring, and those who were lucky enough to make fairly good catches did very well.

SARDINES

A very large increase is to be noted in the sardine catch as compared with the previous year. This year 279,349 barrels were taken, as against 174,640 barrels in 1927. The marketed value of the catch for the present year was \$1,284,771, as against \$1,046,250 for 1927. There is very little to be noted in connection with any fluctuation of the prices being paid for these fish—the average price for 1927 being \$1.21 per barrel, against \$1.25 per barrel during 1928. The catch of sardines on the whole eastern portion of the State of Maine coast was light in 1928, with the result that the canners of that section were, in a very large measure, dependent on the weirs on the Canadian side for their supply. While this condition of affairs assured our fishermen a steady market for their catches, it did not have the effect of producing competition among the buyers in the purchase of their supplies, with resultant high price.

SALMON

There was a considerable falling off in the catch of salmon for the present year, as compared with the previous year and only 2,500 cwt. were taken, while the catch for 1927 amounted to 3,462 cwt. While the catch made by the fishermen was quite light, at the same time, the run of salmon which entered the rivers for the purpose of spawning was very heavy. The small catch made by the fishermen can, in large measure, be attributed to the fact that the streams were fairly high during the summer months, with the result that the salmon readily entered them and, thereby, got beyond the reach of the commercial net fishermen, whereas, during summers when the rivers are low, salmon stay out in the bay until a much later period. The run of salmon in the Pocologan and New rivers in Charlotte county was very heavy, while the run in the tributaries of the Petitcodiac river was phenomenally heavy. These fish were protected better than ever before, and if natural conditions are favourable for propagation, the fishery ought to benefit immensely from the vastly increased number of fish which spawned in the rivers during the past fall.

ALEWIVES

The alewives catch was slightly less than during the previous year; 21,505 cwt. were taken during 1928 and 23,000 cwt. in 1927. A large portion of the 1928 catch was salted, as the demand for the fresh article was limited. The salt alewives are exported, principally to Haiti. Market conditions were poor and the low prices of the previous year continued.

SHAD

There was a considerable increase in the shad catch and 2,888 cwt. were taken, as against 1,689 cwt. in 1927. A very heavy run of shad again ascended the Petitcodiac river for the purpose of spawning. In order to protect these fish while on the spawning grounds, it was necessary to put on a force of guardians. They did their work in a thorough manner and the fish were permitted to spawn and return to the sea again. There is no question that the fishery will greatly benefit from the large number which spawned in this area.

LOBSTERS

A slight increase is to be noted in the lobster catch as compared with the previous year; 7,177 cwt. were taken, as against 6,735 cwt. in 1927. The price paid, however, was not nearly so good as during the previous year, with the result that, while the marketed value of the 1927 catch was \$194,425, the catch of 1928 had a marketed value of \$149,537 only. The fishery is practically holding its own under present conditions.

FISH WASTE

A large quantity of refuse from ground fish is each year thrown away. It is believed this material could be converted into fish meal and fertilizer at a profit. However, up to the present, all of it has been thrown away. During 1928 about 9,000 cwt. of this waste was produced in the vicinity of Wilson's beach, Campobello; 7,000 cwt. at Beaver harbour; 14,000 cwt. at North head, Grand Manan; and 2,500 cwt. at Chance harbour, St. John county.

REMARKS

On the whole, the position of the average fisherman has improved somewhat during the year; and while comparatively low prices have been paid for practically all kinds of fish, there has been a strengthening of market conditions, with a better demand for the fisherman's products and slightly increased prices, in many instances. At the present time, conditions are such as to warrant a more hopeful attitude on the part of all those who are engaged in the fishing industry. The great drawback of this section is the lack of mild-curing fish establishments. Generally speaking the fish are either shipped out in a fresh condition, which, of course, means the employment of very little, if any, labour, or they are salted and sun-dried, either by the fishermen or by small fish concerns, which also means the employment of a very limited amount of labour. On the other hand, if there were a number of concerns in this section putting up fillets of all kinds, during the summer months, as well as smoked haddies, bloaters, boneless herring, etc., with the necessary cold-storage facilities, the industry would be on a very much more satisfactory basis. The sardine manufacturing plant of Connors Bros., Limited, at Black's harbour, gives employment to a large number of hands and is of great benefit, not only to that particular section but to the whole county of Charlotte as well, but, unfortunately, it is the only concern which employs labour to any considerable extent.

The following tables cover licenses, certificates and prosecutions during the year:—

Kind of license	Number
Herring weir.....	653
Lobster fishing.....	520
Lobster pounds.....	6
Permits to dig clams.....	101
Cannery.....	9
Salmon drift-net.....	91
Shad gill-net.....	50
Seine permits.....	15
Reduction works.....	4
Scallop.....	3
Confiscations.....	60
Prosecutions.....	33

REPORT OF SUPERVISOR A. L. BARRY, DISTRICT No. 2, NEW BRUNSWICK, FOR 1928-29

District No. 2, New Brunswick, comprises the counties of Westmorland (Northumberland strait side only), Kent, Northumberland (except the North-west and Southwest Miramichi), Gloucester and Restigouche.

The total marketed value of the fishery of the district for the year 1928 was \$2,825,076, as against a value of \$2,524,726 for 1927, an increase of \$300,350.

The following table shows the catch and marketed value of the different fisheries for the respective years 1928 and 1927:

	1928		1927		
	Quantity	Value	Quantity	Value	
		\$		\$	
Lobsters.....	cwt.	50,793	887,658	43,017	760,628
Smelts.....	"	59,501	906,588	45,990	684,260
Salmon.....	"	9,472	193,687	18,624	338,538
Cod.....	"	150,716	372,819	117,442	226,415
Oysters.....	bbl.	12,383	107,808	13,574	100,576
Tomcods.....	cwt.	17,266	63,774	20,246	91,979
Herring.....	"	175,521	154,683	257,609	193,593
Clams and quahaugs.....	bbl.	6,937	35,296	8,704	34,099
Mackerel.....	cwt.	18,611	37,899	9,271	30,303
Alewives.....	"	665	490	16,434	21,477
Hake and cusk.....	"	10,566	15,994	8,963	18,692
Haddock.....	"	714	1,690	1,099	2,335
Shad.....	"	3,723	31,434	1,031	7,594
Flounders.....	"	10	20	55	55
Mixed fish.....	"	86	86	528	528
Trout.....	"	88	1,800	172	3,998
Bass.....	"	206	3,530	482	9,338
Eels.....	"	321	4,866	32	300
Seals.....	no.	508	2,115		

LOBSTERS

It is pleasing to note an increase in the catch of lobsters of over 7,000 cwt. There was a great decrease in the number of canneries in operation, there being 22 fewer packing licenses issued than in the previous year when 125 canneries were in operation.

During May there occurred a heavy storm which destroyed in some cases 50 per cent of the traps. Had it not been for this, there is reason to believe there would have been even a much larger catch of lobsters in the northern district. There was very little illegal fishing in the northern district after the close of the season, due to the strict patrol that was maintained and to the fact that the fishermen seem to have learned that it is more profitable to catch their lobsters during the seasons provided by law.

SMELTS

There was an increased catch of over 13,000 cwt. in the smelt fishery with a corresponding increase in value. This fishery seems to be holding its own. The market is always good and the price to the fishermen in 1928, particularly during the December fishing, was above the average, varying from ten to fifteen cents per pound. In the Miramichi system the quality of the smelts was the best for many years, many shipments running over 50 per cent extras. It is regretted there was considerable loss to the fishermen through nets being carried away by floating ice. The loss throughout the district is estimated at about \$20,000.

Some attempts were made at illegal fishing about a week before the season opened, due to the fact that there were full moon tides on November 27 and the rivers were consequently teeming with smelts. The work of the overseers and guardians during this period should be commended. At no time did they let the situation get out of hand, and practically all attempts at illegal fishing were thwarted. A number of seizures of fish and fishing gear were made.

Splendid protection to the spawn run of smelts in March and April of last year was also given with the result that there were very few shipments of illegally caught fish after the close of the season.

SALMON

Last year showed the poorest catch of salmon in recent years. It was but 50 per cent of the catch of the previous year and for this reason the price paid was higher. The decreased catch was not confined to any particular part of the district but was general throughout, and as well among the trap-net as the drift-net fishermen. This is not taken to indicate any great decline in the salmon fishery, but fishermen and dealers alike look on 1928 as an off year and it is expected that this year the salmon will come back in the usual numbers.

Very little illegal fishing took place after the close of the season, and it is reported that those who did try reaped but little fruit for their efforts. Any fish which may have been caught were disposed of locally as, owing to the strict check kept on the shipping points of the railway, it is not believed that any illegal shipments were made.

COD

There was an increase of about 33,000 cwt. over the previous year in the catch of cod, with a corresponding increase in value. The weather generally was pretty good. A stimulus was given to this fishery by the presence in Gloucester county of an instructor and demonstrator in cod splitting, packing and drying. This instructor was procured and sent as a result of one of the recommendations of the Royal Commission on Fisheries, and your inspector is able to report that a great improvement in the preparation of cod has already been shown as a result of the instruction given to the fishermen.

The price of cod averaged \$2.25 per cwt. more than last year, owing to better quality, due to better climatic conditions for drying. There was only 8 per cent No. 2 quality in Caraquet this year compared to 60 per cent during the year 1927.

OYSTERS

There was a decrease of about 1,100 barrels in the catch of oysters compared to 1927, but there was an increase in value, nevertheless, of nearly \$7,000. This increase in value must be attributed to the better quality of oysters raked which must also in a great measure account for the decreased catch. For the past two years, great pains have been taken by your officers to raise the standard of the quality of oysters shipped from this district. Good notice of this intent was given to the fishermen and dealers in 1926. In 1927 the enforcement of a better catch was urged but not too severely and last year, when it was felt that all the fishermen and dealers were thoroughly acquainted with what was required, a strict check up of all catches and stocks was frequently made and a number of prosecutions were instituted against both fishermen and dealers for handling undersized oysters.

More prosecutions were instituted in connection with the oyster fishery than any other but, in spite of this, both fishermen and dealers were cheerful over having the law strictly enforced and the work of your officers was commended. Where a few years ago the average price of oysters varied from \$4 to \$8 per barrel, during the 1928 season the price ranged from \$6 to \$13 with buyers always ready to pay the top-notch price for good quality stock. The decrease in the oyster catch may partly be attributed to the fact that during the latter part of October and November very strong winds prevailed with the result that fishermen were only able to fish on an average of about three days per week.

On the Miramichi bay two or three persons have staked out areas with a view to oyster cultivation, and it is expected that within the next year or two considerable of the bed of the bay will be developed along this line. Probably no district in Canada presents such a great area for oyster cultivation as the eastern coast of the province of New Brunswick with its numerous bays and

flats and the number of streams of fresh water flowing over them. With due conservation and development of suitable areas where no beds now exist, oyster fishing can be turned into a most profitable fishery, as the cost of fishing is very slight and the market insatiable.

TOMCODS

In the tomcod fishery there was a decrease of about 3,000 barrels in the catch and about \$28,000 in marketed value. The decrease is accounted for mainly by the poor market in January and February, 1928, when the price dropped to as low as 50 cents per barrel, and many fishermen gave up fishing as a result. There seems to be no falling off in this fishery.

HERRING

There was a decrease of about 82,000 cwts. in herring catch over the previous year, and a decrease in marketed value of about \$38,000.

CLAMS AND QUAHUGS

The clam and quahaug fishery shows a decrease of about 1,700 barrels, but an increase in value of \$1,000. There are now seven canneries in operation in this district for the purpose of canning these shell-fish, as compared with two about four years ago.

MACKEREL

The catch of mackerel in 1928 was about double that of the previous year, with an increase in marketed value of \$7,500. During the spring months there was an excellent run of the very best quality of fish.

ALEWIVES

In recent years no fishery has shown such sudden decrease in catch as did the alewife fishery this year. Whereas in 1927 16,434 cwt. were taken, this year but 665 cwt. were caught. The market seemed to be off entirely for salted alewives and there is very little demand for them in the fresh state.

HAKE AND CUSK

There was an increase of over 1,000 cwt. in catch of hake and cusk, with an increase of about \$3,000 in value. Conditions for fishing were good.

HADDOCK

There was a slight decline in the haddock catch, with a corresponding decrease in the value of the fishery.

SHAD

About four times the quantity of shad were taken in 1928 than was caught in the previous year. After having been quiet for a number of years this fishery seems to be coming back, particularly to the Miramichi waters.

EELS

Although no great quantity of eels are taken in this district, the catch last year was 321 cwt., as against 32 cwt. in the year previous.

BASS

A decrease of 276 cwt. of bass were taken.

ANGLING

On account of the scarcity of salmon, salmon angling was not very good in 1928. However, considerable grilse were taken. Trout fishing was excellent throughout the district in all fresh water streams.

PROTECTION

There seems to have been better observance of the fishery laws throughout the district this year than ever before. Although the number of confiscations and prosecutions ran pretty high it was due to the vigilance of the overseers and guardians who were on the job all the time and interfered with practically all attempts at illegal fishing.

The number of confiscations would seem to show that considerable illegal activity was being carried on, but it is well known that the fishermen reaped very little benefit from such activity. Never during the past five years have the part time guardians attended to their duties as they did this year. The presence of two fast patrol boats was a great preventive of illegal fishing. In Kent county, north of the Chockpish, where during the close season of 1927 about 5,000 lobster traps were taken as a result of illegal fishing, in 1928 only 588 traps were seized. Continued co-operation in the enforcement of the lobster regulations has been forthcoming from both fishermen and dealers. In the past it has been known that in that part of District No. 8 in New Brunswick there was a considerable destruction of berried lobsters by fishermen. As the ratio of the berried lobster to the male was about 50 per cent, there was a great temptation on the part of the fishermen to brush off the berries and sell the thus brushed lobsters to the canneries and lobster pounds. Last year a drive was made against this traffic, with the result that eleven prosecutions were instituted and convictions secured. Heavy penalties were imposed which had the desired result. It is intended that there shall be no let up in the strict enforcement of this part of the lobster regulations.

SEALS

There has been less complaint than previously, from the salmon fishermen about the destruction of salmon and nets by hair seals. The bounty of \$3.50 seems to be sufficient incentive to the fishermen to engage in the destruction of these marauders. In 1928 there was \$1,988 expended in bounties in this district, and probably as much more could have been paid were the funds available. The bounty system for the destruction of seals seems to be the most effective way of getting rid of them. In addition to the amount received from bounties, some fishermen received from \$2 to \$3 for the skins of baby seals. A couple of men from the province of Quebec spent considerable time in the district engaging in the destruction themselves and buying skins from the fishermen. No move seems to have been made to market the oil.

PROSECUTIONS

Throughout 1928 there were 54 prosecutions all told, as against 63 in the year previous. There were 109 confiscations as against 130 for 1927. Prosecutions were for offences as follows:—

Offence	Prosecutions
Breaches of the Lobster Regulations.....	18
“ Oyster “	19
“ Salmon “	11
“ Smelt “	3
“ Trout “	2
Interference with an officer.....	1
	54

LICENSES

The following licenses were issued during the year:—

Class of license	No. issued
Smelt bag-net licenses.....	6,460
Lobster fishing licenses.....	1,981
Oyster fishing licenses.....	850
Salmon trap-net, pound-net or weir licenses.....	395
Smelt gill-net licenses.....	225
Salmon gill-net or drift net licenses.....	111
Lobster packing licenses.....	103 (1 cancelled)
Quahaug fishing licenses.....	85
Bass fishing licenses.....	54
Gaspereau pound-net or trap-net licenses.....	45
Lobster packing extension licenses.....	41
Cannery licenses.....	7
Lobster pound licenses.....	3
Total.....	10,360

The amount of fines collected for the year was \$1,101, and the amount received from the sale of confiscated property was \$435.84.

REPORT OF SUPERVISOR H. E. HARRISON, DISTRICT No. 3, NEW BRUNSWICK, FOR 1928-29

In District No. 3, New Brunswick, are included the counties of Kings, Queens, Sunbury, York, Carleton, Victoria, Madawaska and the tidal waters of the Northwest and Southwest Miramichi rivers in Northumberland county.

Ninety miles of the Saint John river were clear of ice on April 15, but there was much ice in the river above that, and a very heavy jam just above Fredericton, most of it remaining until wasted by the sun some weeks later. Much damage was done by the up-river ice, as most of the barns and large trees on the islands were swept away. Fresh alewives were on sale in Fredericton on April 13, having been taken thirty miles below on the 10th of that month, and the freshet reached eighteen feet over low-level on April 14. On April 21 three bright salmon were caught ninety-five miles in from the bay of Fundy and sold in the Fredericton market. The Southwest Miramichi river was pretty well clear of ice on April 15. The first shad that I have record of was taken May 17 fifty miles in from the bay of Fundy, and the first taken at Grand Falls, more than 200 miles in from the bay, were on June 5. Shad were in the Southwest and Northwest Miramichi rivers in large numbers on the first of June, but very few salmon had reached those rivers at that date. The weather, mostly, was stormy or unsettled well into June and all waters were high; therefore, alewives, shad, and salmon had good opportunity to reach all upper waters before nets could bother them much. In some respects the season's operations were exceedingly satisfactory, while in other respects the commercial fisheries were quite unsatisfactory.

The total weight and value to the fishermen of the catches of commercial fish for the years 1927 and 1928 are as follows:—

Year	Cwt.	Value
1927.....	11,723	\$ 39,624
1928.....	6,235	37,835

There was thus a decrease in weight of 5,488 cwt., nearly 50 per cent, in 1928, but a decrease in value of only \$1,789, a little over 4 per cent. Had there been any reasonable demand for alewives and shad in the Miramichi district the statistics would have made a very favourable showing for 1928.

ALEWIVES

Year	Cwt.	Value
1927.....	9,144	\$ 13,432
1928.....	1,988	3,589

It would appear that the fishermen of the Miramichi area must adjust themselves, as the alewife fishermen of the Saint John river area had to do some years ago, to greatly changed conditions. While the 1927 season was considered bad, in that price was low and sales were slow, the fishermen eventually got rid of most of their pack at some price, but it is understood that the dealers had difficulty later. A decrease in 1928 of 7,156 cwt. and \$9,843, practically the whole of which was in the Miramichi district as the Saint John river area is not a heavy producer now, means considerable to the fishermen. The reason for the lack of demand in the Miramichi district is not altogether clear. It is said that other fish are taking the place of alewives in their former market, while, on the other hand, it is said that the fishermen do not pack their fish properly and exporters do not care to handle them. Whatever the cause, the effect is a serious matter for the fishermen, and to the whole community, as it was, and is yet, in the Saint John river district. It would be of great benefit if the alewife fishery could be placed on a paying basis again.

BASS

The bass fishery of the Miramichi district is nil at present, and is practically so on the Saint John river area as well.

EELS

Year	Cwt.	Value
1927.....	125	\$ 500
1928.....	420	1,800

The catch of eels in 1928 was gratifying and the increase over that of 1927 substantial. In the Saint John river they are taken in pots, or traps, and sold for only \$4 per cwt., while in the Northwest Miramichi river they are taken by spearing through the ice in the daytime and sold for \$7 per cwt. The Indians in Nelson reserve follow this fishery.

MULLETS

A proportionately large increase in mullet catch is recorded for 1928, 365 cwt. against 255 cwt. in 1927. Mulletts are quite a favourite dish with the Jewish population.

PICKEREL

Year	Cwt.	Value
1927.....	480	\$ 5,560
1928.....	450	5,850

While this fishery shows a decrease of 30 cwt. in 1928, it also shows a slightly increased value, indicating a very satisfactory price on the market. This fishery is not too greatly exploited.

SALMON

Year	Cwt.	Value
1927.....	633	\$ 13,075
1928.....	585	14,262

It is unfortunate to be compelled again to report a decrease in the catch of salmon in 1928, amounting to 48 cwt., with an increase in value, but the figures compared with those for the previous year do not indicate a serious condition, but when they are compared with those for some previous years the case is worthy of more comment. The Miramichi district appears to have produced about the same as it did in 1927, which is not a creditable showing

when compared with former catches, but the Saint John river is disappointing; however, it appears to have been a lean season in all parts of New Brunswick. A considerable proportion of the licensed salmon fishermen, both in the Miramichi and Saint John river districts, made no attempt to operate their stands during the past season. There is always more or less of this condition, but the number that did not operate in 1928 was much greater than usual. There are two reasons for this, one being that a number of persons always take out licenses, or permits, to operate, but seldom operate, intending only to make secure their stands for the future. Another class are those who will not go to the expense of purchasing nets, or, if they already have nets, of operating, until they hear of a neighbour making some good catches that would make it worth while setting up a stand. Conditions in 1928 did not warrant many in going to any expense. In confirmation of this statement may be cited an instance.

On the 6th of August, Overseer McNally left Meductic in a canoe at twelve o'clock (noon) and landed at Springhill at twelve o'clock (midnight), a distance of 47 miles, 43 of which is non-tidal water of the Saint John river. In this area of forty-three miles fifty-eight persons had permits to operate salmon nets and there was evidence of only twenty-three having been operated during the season. The officer stated that this was about the proportion of stands that had been in the river during the season; therefore the number of licenses and permits issued is not very good evidence, to those who do not know conditions, of the number of stands being operated. A visit to Overseer Parks' district, earlier in the season, showed a like, or greater, proportion of stands not being operated in both tidal and non-tidal waters of the two Miramichi rivers. These instances would appear to indicate that salmon were not running into the rivers in very great numbers. During the early part of the season, particularly in York and Carleton counties, indications were that there would be a large run of fish, but the run slackened off in July and in August it was very small. In Kings county conditions were somewhat reversed; whereas the catch was very light in the early part of the season, it was much better in August. The number of nets operated in the Saint John river—the river being large and the nets very small—should not jeopardise the salmon fishery of that river. While the Northwest and Southwest Miramichi rivers are large to the head of tide, the nets also are very large affairs; in the non-tidal area of the Southwest the nets are exceedingly small affairs.

SHAD

Year	Cwt.	Value
1927.....	1,017	\$ 5,108
1928.....	2,015	8,056

An increase of about 1,000 cwt., or nearly 100 per cent over the catch of shad in 1927, ought to be quite satisfactory, at least to the consumers and to the department. Going into details, there are some peculiar features in connection with the shad fishery in 1928, particularly the Saint John river system part of it. After shad come from the bay of Fundy they are in the Saint John river in Kings county, but only a comparatively small proportion is taken there, and only in the uppermost portion of Kennebecasis bay and the lowermost end of that river are they taken in quantities. In 1926 the reported catch in this area (Kings county) was 320 cwt. In 1927 it was 248 cwt., less by 72 cwt.; in 1928 it was reported as 156 cwt., less again by 92 cwt. Coming into the next district above (Queens county) the Saint John river district, the catch reported in 1926 was 128 cwt., 1927, 32 cwt. and for 1928, 37 cwt., while in the Washademoak district conditions are reversed. In 1926 the reported catch was 235 cwt., in 1927 it was 348 cwt., and 1928 it is 732 cwt., an increase of more than 100 per cent in 1928 over 1927. Why shad swarmed in the Washademoak lake district in 1928 is a matter for speculation. In Sunbury county

the catch was half what it was in 1927, in York county it was double and in Victoria county it was a little better than in 1927, but the catch in the Washademoak lake region was three times what it was in all of the rest of the Saint John river system, and the total in the Saint John river system is 300 cwt. better than it was in 1927. Shad remained in the upper part of the river, at Grand Falls, very late. Officer Robertson reported that there were plenty of shad breaking water on the night of July 7 last year. That is unusual.

Some time was spent by the officers and Supervisor with Mr. Giffin, representing the Biological Board, in collecting data on the shad in the Saint John river and tributaries.

Coming to the Southwest and Northwest Miramichi rivers the 1928 return is even more striking than is that for the Washademoak lake section. For the former area Overseer Parks gave the 1927 catch as 343 cwt., and that of 1928 as 1,040 cwt., an increase of more than 200 per cent, and he said that shad were so plentiful that they were offered for sale at 5 cents per fish and when they did not move at that low price some fishermen offered them free to any person who would take them from the nets. The fishermen could not come out of this very well financially, but consumers were supplied with an excellent, cheap food.

STURGEON

Although the sturgeon fishery of the Saint John river is not of very large proportions, it is pleasing to note that the catch went up from 24 cwt. in 1927 to 67 cwt. in 1928, and the value from \$22 to \$35 per cwt. in 1928. No caviar was secured in 1927 while 300 pounds were obtained in 1928, worth \$1 per pound. A fairly good number of very large fish were taken in 1928, while they were small the previous year.

DOMESTIC FISHERIES

All fish taken by rod and line in this inspectoral district are classed as domestic. The totals, both weight and value, show an increase in 1928, as follows:—

Year	Cwt.	Value
1927.....	598	\$ 11,115
1928.....	710	12,830

On the whole, rod and line fishing was fairly satisfactory in 1928. Both salmon and trout make a better showing than in 1927, but the increase does not appear to have been evenly distributed; for instance, while the upper water of the Southwest Miramichi river (Carleton county) shows a slightly better catch than in 1927, the central part (York county) shows a considerable decrease and the lower part (Northumberland county) a very large increase. The latter condition is explained by Officer Parks as the result of a largely increased number of early-spring anglers on Cains river, and to some extent on the Southwest Miramichi river. Cains river is leased by the provincial Government to Mr. W. H. Allen, who reports that he had 146 anglers, practically all United States citizens, on the two rivers during the 1928 fishing season. These men, and some women, stay from one to two weeks and while they retain only what fish they require for camp food, and a very few to take home with them, the total of their catch is considerable. There is no evidence that any of the fish are wasted and apparently no evidence that the fish that have been hooked and voluntarily liberated are hurt, and a large majority are liberated. These are fish that have ascended the Miramichi and Cains rivers the previous season, and remained in fresh water during the winter, and are ready to eat almost anything on their way back to salt water. The down-run fish are mostly salmon of medium to fairly large, while the up-run, or fresh-run, fish in the Southwest Miramichi are mostly grilse, two to four

pounds. More mature salmon are taken in the Northwest than in the Southwest Miramichi river, and, proportionately, the rod fishing yielded as well, or better, than the net fishing.

Sea trout fishing on these waters was excellent; said to be the best it has been for many years, and one trout of seven pounds weight was taken from the Northwest river area.

Salmon angling on the Saint John river was not good. More or less are taken between Fredericton and the mouth of the Tobique river, but the water needs to be fairly low for good salmon angling on this river, and it was too high nearly all of the 1928 season. The Tobique river catch also fell off in 1928, 47 cwt. being taken as against 86 cwt. in 1927, 65 cwt. in 1926 and 48 cwt. in 1925, and smaller quantities previous to that. It was reported on the Tobique last season that a prolific run ascended the river during the spring freshet and passed up to the head waters without stopping in the pools as they usually do. It would appear that this might have been the case as bright, or fresh-run, salmon were taken in nets in the Saint John river earlier than usual.

Landlocked salmon and trout fishing on the Saint Croix river and adjoining waters, in this district, was very satisfactory in 1928.

In connection with the operations of the Tobique Salmon club on the Tobique river, it may be pointed out that from the time of the organization of the club, nearly forty years ago, Thomas F. Allen was the superintendent of the club and gave very faithful service. When Mr. Allen first took charge of that portion of the river which the New Brunswick Government had the right to lease, consisting of water flowing through Crown lands, conditions were very bad, as the natives had been, and were, taking every possible fish by every possible means that could be taken. The first year's operations by the club netted it seven salmon. Between that time and the year 1927, with the splendid service Mr. Allen and his assistants gave, together with modern regulations applied to the Saint John river, in net fishing in the non-tidal area and a much more satisfactory protective service in the latter area, as well as on the whole river during recent years, angling grew from seven salmon taken about 1889 to 86 cwt. in 1927, representing, probably, from twelve to fifteen hundred salmon and grilse.

PROSECUTIONS

Twenty-five persons were prosecuted, before magistrates, for violations of the act and regulations during 1928. All were convicted and penalties were struck. Sixteen were required to pay fines amounting to \$355 and costs. In eight cases fines amounting to \$500 were imposed and suspended, but the defendants paid costs in each case. In one case the defendant was fined \$50 with costs against him, but he left the district immediately and has not returned yet.

SEIZURES AND CONFISCATIONS

During the year seventy-two confiscations were made, some of which consisted of two or more twine or woven-wire nets under one seizure and confiscation. A few salmon were taken with the nets and if alive they were liberated, or if dead they were sold. The seized materials would cost the operators \$500, at a low valuation. Most of it was destroyed, either because it was illegal material at any time or that it was difficult for the officer and guardians to handle while on patrol. Some legal nets are stored at this office for future sale. Materials to the value of \$95.80 were sold. Most of this was material seized in the previous year. As usual, a great amount of illegal salmon fishing was attempted on the Southwest Miramichi river, mostly after the legal salmon netting season was past, but the number of seizures would indicate that all were not successful in the attempts. Overseer Parks and most of his guardians did

very effective work. With a firm hand, it will not be long before such people of the Southwest Miramichi river district as are inclined to practice illegal fishing for salmon will see the error of it.

FISHERY LICENSES

The following licenses and permits were issued during the year:—

Kind of license	1927	1928
Salmon gill-net or drift-net.....	120	122
Salmon net permit.....	172	159
Salmon pound-net, trap-net or weir.....	109	102
Shad gill-net or drift-net.....	282	270
Gaspereau pound-net or trap-net.....	27	8
Bass fishery.....	28	40
Sturgeon fishery.....	13	10
Smelt gill-net.....	1	1
Whitefish fishery.....	13	14

REVENUE

Revenue from all sources during the year was as follows:—

Licenses and permits.....	\$ 492 85
Prosecutions (fines).....	355 00
Sale of seized materials.....	95 80
	<hr/> \$943 65

REPORT OF SUPERVISOR J. B. SKAPTASON, PROVINCE OF MANITOBA, FOR 1928-29

The total commercial production of all fish for the calendar year—307,321 cwt.—shows a decrease from the previous year of 15,646 cwt., though seventy-seven more men were employed. The reason may be largely ascribed to very unseasonable fall weather delaying commencement of winter fishing ten to twenty days, owing to late freeze-up. Immediately following the freeze-up, further trouble was experienced by continued breaking up of the ice on all the larger lakes, which resulted in losses of thousands of nets; there are several instances where gangs lost their entire outfits. This further disorganized the operations, as in some instances men never lifted a net and quit, while others carried on with much impaired outfits.

The estimated loss in nets may be reasonably summed up as follows:—

	No.	Value
Lake Winnipeg.....	2,000	\$ 15,000
Lake Manitoba.....	2,800	19,600
Lake Winnipegosis.....	1,000	8,000
	<hr/> 5,800	<hr/> \$42,600

Individual misfortune has thus hit hard in places, but the industry as a whole has enjoyed a much better year than in 1927. With a decrease in production of over two million pounds, the price paid to fishermen was \$198,296 greater, and the value, as marketed, \$200,576 higher than 1927.

The following figures will show the fluctuations in catch and prices as marketed of the principal varieties for the two years:—

	1927		1928	
	Quantity	Value as marketed	Quantity	Value as marketed
	Cwt.	\$	Cwt.	\$
Catfish.....	1,434	17,610	1,018	10,096
Goldeyes.....	11,420	115,190	10,642	115,124
Mullets.....	11,739	19,653	11,657	23,797
Perch.....	2,161	23,816	1,521	17,326
Pickrel.....	99,813	804,854	101,870	921,010
Pike.....	40,166	149,658	36,366	154,550
Saugers.....	2,461	13,348	4,104	28,795
Trout.....	1,111	12,097	935	10,112
Tullibee.....	102,451	419,103	89,068	484,129
Whitefish.....	49,114	418,461	49,899	473,232

The following figures give the production and value by years for the past five years:—

Year	Quantity	Landed value to fishermen	Value as marketed	Number men employed
	cwt.	\$	\$	
1924.....	177,898	886,410	1,232,563	2,828
1925.....	190,240	1,061,331	1,466,939	3,390
1926.....	304,307	1,744,642	2,328,803	3,809
1927.....	322,967	1,422,680	2,039,738	4,095
1928.....	307,321	1,620,976	2,240,314	4,172

The following are comparative prices, as marketed, of the more important species for the five years from 1924 to 1928 inclusive:—

	1924	1925	1926	1927	1928
Catfish.....	11.1	10.6	11.3	12.3	9.9
Goldeyes.....	4.4	4.2	4.0	4.7	6.4
Perch.....	10.6	11.2	13.4	10.9	12.7
Pickrel.....	8.5	11.5	10.3	8.0	9.0
Pike.....	3.5	4.0	4.0	3.7	4.0
Sturgeon.....	50.0	40.9	51.6	53.9	57.5
Trout.....	10.0	9.0	11.0	10.9	10.8
Tullibee.....	3.6	4.1	5.9	4.0	5.4
Whitefish.....	9.5	9.5	9.0	8.5	10.5
For total catch.....	6.9	7.4	7.6	6.1	7.2

The very small yield of sturgeon as shown by the report is owing to the change made in regulations putting an absolute closure on lake Winnipeg and permitting of sturgeon fishing in the northern areas of the province in winter only. Then in the case of the Churchill river, and other waters situated immediately west of the border of Manitoba and administered from here, in the past, the production of these waters had been included in the Manitoba returns but will now for the first time be included in that of Saskatchewan, both as to sturgeon and other fish.

THE SUB-DISTRICT OF THE PAS

This sub-district comprises all waters north of and including the Big Saskatchewan river, but not lake Winnipeg.

This district is now undergoing great changes, all of which more or less directly affect the fishing industry. A railway now completed to the Flin-Flon

mining property, with an extension from Cranberry portage to the Sherritt-Gordon properties, will bring within easy distance of railways many lakes and rivers that have in the past been too far from The Pas to permit of profitable fishing owing to the high cost of freighting by teams. Now where rail transport ends, tractors with trailers take over the transportation of freight. As an instance of this change and benefits, the following may be cited:—

The areas of the Churchill waters situated between Pelican narrows and Island falls (power development is now going on at the latter place for the Flin-Flon mines) is the centre of the main sturgeon fishery of the Churchill. It was a twenty-day round trip with teams to bring the fish to The Pas; now the fish is loaded on tractors and landed the same day at railhead at the Flin-Flon, and the following day taken by train to The Pas. With the extension of the railway under way from Cranberry portage north to Cold or Kississing lake, the location of the Sherritt-Gordon properties, it may be said that all the waters along the western part of these northern areas of Manitoba will be brought within easy reach of railway transportation; even such lakes as Reindeer and South Indian will be brought within one hundred miles, which in the older part of the province is not thought a great distance to haul fish.

Beginning with this year a change is made in reporting the production of The Pas district. Heretofore the entire production has been shown in one report. A division has now been made, dividing the water areas into groups. The system followed in the grouping is that of placing all lakes that are in the same drainage or water course in one unit. Thus five groups are created. Group 1 consists of Cold lake; Group 2, Athapapuskow and Egg lakes; Group 3, Cedar, Moose, Cormorant and Clearwater lakes; Group 4, Pikwitonina, Partridge Crop, Matawanan, Wintering and Kiska; Group 5, Long and Landing lakes, and the Nelson river and tributaries above Split lake.

During the past year summer fishing was carried on in Moose lake in a limited way. One license was also given on each of the following lakes: Clearwater, Cold or Kississing, Partridge Crop, and Athapapuskow. Summer fishing on the last four lakes was permitted solely for the purpose of supplying the local demand in connection with the mining operations and railway construction work, and none whatever was exported. It was therefore all included in the one statistical report for summer fishing.

The following are figures for production by lakes and group, both summer and winter, for The Pas sub-districts:—

Lakes	Whites	Pickarel	Trout	Mixed	Men
	cwt.	cwt.	cwt.	cwt.	
GROUP 1					
Cold.....	200	12	70	50	3
GROUP 2					
Athapapuskow.....	508	301	130	35	8
GROUP 3					
Clearwater.....	596		125	27	17
Cormorant.....	1,024	266	32	95	21
Moose.....	3,285	871	375	280	46
Cedar.....	344		25		6
GROUP 4					
Pikwitonina.....	12			17	1
Wintering.....	120			48	1
Partridge crop.....	460			60	4
Matawanan.....	65				1
Kiska.....	310			180	3
Herb.....	820	103		210	13
Little herb.....	210	26			2
Reed.....	1,250	460	178	274	14
GROUP 5					
Long.....	25				1
Landing.....	200			80	4
Nelson River.....		Sturgeon 5 cwt.			2

Attention should be drawn to the fact that in these northern areas fishing, in most cases so far, is carried on as a side issue to trapping and prospecting. In many instances the men operating have only a few nets, or only a small part of what is allowed under the license.

Lake Winnipegosis shows a general decrease in production. This is particularly noticeable in the unlimited winter operations. With eleven more men operating, the total decrease was 4,439 cwt.; however, the better prices obtained more than made up to the fishermen this shortage as the price realized by them was \$61,169 greater than in the previous year. The shortage in the catch is nowhere outstanding but is spread over all varieties, excepting whitefish, which shows a slight increase.

In summer this lake is fished under a limit of one million pounds for whitefish and pickerel, with a time limit of seven weeks ending on the first Saturday in October. During this operation pickerel showed up wonderfully well; in fact some of the greatest catches in the history of the lake were recorded. The limit was taken in one day under four weeks, or in nineteen lifts.

The following are comparative figures for 1927 and 1928 for *Lake Winnipegosis*:—

—	1927				1928			
	Whites	Pickerel	Mixed fish	Number men	Whites	Pickerel	Mixed fish	Number men
	cwt.	cwt.	cwt.		cwt.	cwt.	cwt.	
Summer.....	2,073	8,748	1,419	182	1,323	8,668	1,571	211
Winter.....	5,114	16,644	27,596	396	5,422	16,204	23,289	407

Lake Dauphin shows another big increase in production. For several years prior to 1927 this lake had shown a gradual decrease in production, which culminated in a low mark for the winter of 1925-26. Many fishermen had decided not to operate there the following winter. However, the winter of 1926-27 showed a reversal of conditions to such an extent that, with four less men fishing than in the previous winter, the production was more than doubled; again last year the production nearly doubled. The following shows the catch for the last three years:—

—	Total catch	Number of men
	cwt.	
1926.....	876	25
1927.....	2,313	21
1928.....	3,844	47

Lake Waterhen shows a very considerable decrease in production in almost every variety of fish. This is particularly noticeable in the case of whitefish.

Lake Manitoba.—This lake records a very sharp decline for the year. The following are figures for five years past:—

—	1924	1925	1926	1927	1928
Number of fishermen.....	779	905	1,128	1,126	1,082
Total production.....	cwt. 48,658	cwt. 51,587	cwt. 85,256	cwt. 77,858	cwt. 57,463
Catch per man.....	62	57	76	69	53

The decrease is in every variety excepting mullets, and is particularly noticeable in the tullibee catch, which is little more than half that of the previous year. This general decrease can be fairly assumed to be caused by the late freeze-up which delayed the general setting of nets pretty well until the end of November when the main tullibee run was over. An added factor was the constant breaking up of the ice well into December, with a loss of nearly 3,000 nets and a general disorganization of operations.

There is very general satisfaction amongst all concerned in the industry over the building of the pickerel hatchery at the mouth of Swan creek.

Lake St. Martin shows some increase as against 1927. With a normal freeze-up this increase no doubt would have been considerably greater. The lake is shallow and usually very little fishing is done there; after the first of the year, it is thought, the fish return, with the setting in of cold weather and thick ice, to the deeper waters of lake Manitoba and lake Winnipeg.

Lake Winnipeg.—This lake has, on the whole, had a fairly good year, comparable even to the record year of 1927. With 78 more men operating, the production increased 7,172 cwts. While sturgeon, our high price fish, is eliminated owing to change in regulation, there is an increase both in price to fishermen and as marketed to correspond fully with the increase in production.

The following are comparative figures for 1927 and 1928:—

—	1927					1928				
	Whites cwt.	Pick- erel cwt.	Tulli- bee cwt.	Other fish cwt.	Men	Whites cwt.	Pick- erel cwt.	Tulli- bee cwt.	Other fish cwt.	Men
Summer.....	25,679	30,724	19,475	9,822	1,418	26,538	32,407	30,739	8,251	1,483
Winter.....	2,581	12,887	52,160	8,269	678	4,355	16,772	41,368	11,166	691
Total.....	28,260	43,611	71,575	18,091	2,096	30,893	49,179	72,107	16,520	2,174

It will be noted there is no great difference in any of the varieties in the two years. The chief increase is in pickerel, 5,568 cwt., and whitefish, 2,633 cwt.

There is a very decided increase in open water tullibee production amounting to more than a million pounds. The reason for this was the mild weather and long open fall, which permitted uninterrupted fishing by boats right to the end of the season, the 10th of November. A falling off in the winter production, however, brings the total for the year to only slightly more than 1927.

The increase in pickerel, which is shown in both summer and winter production, is most encouraging, and there is a general tone of optimism amongst dealers and fishermen.

The summer whitefish season of that area of the lake, to the north of Berens island is from June 1 to August 15, and for a limit of 3,000,000 pounds of whitefish and pickerel combined. While about 170,000 pounds less than this limit was taken, it was not so much shortage of fish as because of other causes, the chief of which seems to have been that the whitefish had gone to fishing grounds towards the west shores of the lake, where it has not been found in any large quantities for many years, and where the operators were not in a position to go owing to absence of ice and other convenience. A few sets made in the vicinity of Reindeer and Horse islands produced big catches.

DEVELOPMENTS

The most important development in the industry during the year is the formation of a "Fish Pool". This is known as the Manitoba Co-operative Fisheries, incorporated under the Manitoba Co-operative Societies Act. The president and organizer is Paul Reykdal, and the manager G. F. Jonasson. The head office has been opened at 325 Main street, Winnipeg. The pool commenced operations with the opening of the present winter season.

This co-operative effort has been discussed for a number of years by fishermen and independent dealers, but no definite action was taken until about two years ago when the matter was laid before the Manitoba Co-operative Marketing Board. After some inquiries they decided to make a thorough investigation of the industry so as to enable them to make a recommendation. Things developed so rapidly, however, that those most interested, particularly in fresh fish production, felt they could not wait. In the winter of 1927-28 a powerful New York syndicate of commission men and dealers undertook to set a price for fresh fish. These prices were regarded by the fishermen as entirely out of reason for profitable operation. It was also reported that the intention was to further to decree that all fresh fish going to New York must come through one source, generally thought to be controlled by the same New York syndicate. This, whether true or not, seemed to the fishermen to necessitate immediate action. The result was an organization fully formed by mid-summer.

The present membership of the pool is 515, which represents from 1,000 to 1,200 fishermen, as some work with one or more hired men who do not take out membership. The biggest and most representative membership is from lake Manitoba. Lake Winnipeg has the smallest representative membership, compared with number of men and quantity of production, but that is a natural condition until such time as the pool is in a position to enter upon the summer field of operation. It is understood they are now endeavouring to face that situation for the coming summer. The lake carrier question is the big problem, next to that the cold storage.

Fishermen pool members seem to be convinced that they have derived very material benefits by their connection with the pool. There seems also a general feeling that prices, particularly on fresh fish, have been maintained at a steadier and higher level because of the operation of the pool, even in its present partially organized state.

The following figures show quantities of fish handled by the pool up to January 28, 1929, winter production only:—

		Lbs.	Lbs.
Lake Manitoba.....	Frozen.....	1,224,652	1,983,273
	Fresh.....	760,621	
Lake Winnipegosis.....	Frozen.....	606,259	617,111
	Fresh.....	10,582	
Lake Winnipeg.....	Frozen.....	401,888	453,644
	Fresh.....	51,756	
Other lakes.....	Frozen.....	265,011	272,227
	Fresh.....	7,216	
			3,326,255

It seems likely that between five and six million pounds will be handled by the pool during the winter, which should represent from 25 per cent to 35 per cent of the total catch.

A new fishing concern is in process of formation for the purpose of operating on lake Winnipeg. The only remaining waterfront served by the Selkirk dock has been purchased, and, according to published reports, a \$20,000 building program is to commence immediately. It is not known whether the intention is to establish stations on the lake or to buy from fishermen and dealers with independent plants.

There appears to be quite a tendency to break away from the old established order of things in the matter of summer fishing for whitefish on lake Winnipeg. There is a feeling that prices which have stood unvaried, regardless of market conditions, at 5 cents for whitefish for eleven or twelve years and 3½ cents and 2½ cents, respectively, for pickerel and tullibee, do not allow of a reasonable remuneration to the fishermen in a year of average production.

The whitefish is not getting more plentiful in the lake; it is true that in the last three years the limit has been taken, or nearly so, every year, but the number of fishermen has been constantly increasing, and with increasing number of motor-boats making it possible to follow the fish to remote areas, this result has been obtained. This, of course, is a much more expensive method of fishing and it is shown that yearly fewer and fewer of the fishermen come out on the right side of the ledger. Partly from necessity, and partly with the hope of an outlet through the pool, many are establishing small stations, particularly in the southern areas of the lake.

There is a great deal of speculation and interest evinced in the fishing possibilities of waters in the northern areas of the province, as well as Hudson Bay, now made accessible by the extension of various railways northward.

ANGLING

The non-resident angling licenses issued have more than doubled in the year. The one day licenses predominate. The number of licenses issued and the revenue received were:—

936 one day licenses.....	\$	936 00
79 two day licenses.....		159 00
4 three day licenses.....		12 00
94 season licenses.....		470 00
1,113	\$	1,576 00

These licenses are mostly issued to residents of North Dakota, who come across to spend a day or two fishing in lakes along the southern part of the province. The principal waters fished in 1928 were Oak lake, lake Killarney and Rock lake, and small lakes in the Turtle mountains. The fish available are pike, pickerel, perch, catfish or bullheads. A party of eight or ten in a special car came from Saskatoon, Saskatchewan, to try for speckled trout near Kettle rapids on the Nelson; some fine specimens were taken.

The following table shows the estimated quantity of fish taken by anglers during the 1928 season:—

—	Residents		Non-Residents		Total	
	cwt.	\$	cwt.	\$	cwt.	\$
Bullheads.....	50	500	25	250	75	750
Catfish.....	20	200	5	50	25	250
Sheepheads.....	50	500	15	150	65	650
Goldeyes.....	200	1,400	15	105	215	1,505
Perch.....	200	2,000	50	500	250	2,500
Pickerel.....	500	5,000	50	500	550	5,500
Pike.....	900	4,500	700	5,600	1,600	10,100
Saugers.....	70	490	15	120	85	610
Trout.....	60	600	10	100	70	700
	2,050	15,190	885	7,375	2,935	22,565

Number of anglers and value of equipment—

Resident	Value of Equipment	Non-resident	Value of Equipment
5,000	\$8,000	1,113	\$2,783
Total number of anglers.....			6,113
Total value of equipment.....			\$10,783

PROSECUTIONS AND CONFISCATIONS

During the year there were 42 prosecutions in the province as follows:—

Fishing illegal nets.....	13
Obstructing passage of fish.....	2
Illegal possession.....	4
Fishing without license.....	6
Spearing fish.....	4
Using fire arms.....	5
Fishing in close season.....	2
Illegal sturgeon fishing.....	2
Fishing within prohibited area of fishway.....	4
	<hr/> 42

There were 254 confiscations in the province during 1928 with the following results:—

Total amount received in fines.....	\$ 264 50
Total amount received for confiscated articles.....	1,104 73

The following table gives the estimated quantity and value of fish taken by Settlers in the Province for home use during 1928:—

	Quantity	Value
	cwt.	\$
Catfish.....	70	700
Goideyes.....	2,000	16,000
Mulletts.....	14,500	32,900
Perch.....	245	1,560
Pickarel.....	5,530	44,650
Pike.....	8,490	27,842
Saugers.....	75	350
Trout.....	100	1,000
Tullibee.....	2,350	13,650
Whitefish.....	8,100	56,700
	<hr/> 41,460	<hr/> 213,652

Number of nets used.....	3,000	\$ 24,000
Number of dip-nets.....	600	900
Number of lines with hooks.....	200	300
		<hr/> \$25,200

Number of settlers permits issued, 1,160.

REPORT OF SUPERVISOR G. C. MACDONALD, PROVINCE OF SASKATCHEWAN, FOR 1928-29

During the calendar year 1928 the commercial production for the province of Saskatchewan was 61,931 cwt. of fish. This is an increase over the previous year of 4,131 cwt. The increases and decreases of the different species are:—

Species	Increase	Decrease
Whitefish.....	2,344	
Pike.....	1,144	
Mulletts.....	882	
Mixed.....	1,023	
Sturgeon.....	342	
Herring.....	3	
Goideyes.....		4
Trout.....		292
Pickarel.....		699
Tullibee.....		612
	<hr/> 4,738	<hr/> 1,607

The increase in the total production during the year is partly due to an increase of 114 men fishing and also to the production on lakes located on the northeastern portion of the province being included this year which previously were included with the Manitoba production.

The total market value of the commercial production during the year is shown as \$563,533. This is an increase of \$59,924 over the previous year. There is an increase in value for the summer production of \$1,786 and of the winter production \$58,138. The increase in value is not only due to a larger production but also to an increase of 4,405 cwt. of green fish marketed during the winter season, which was largely whitefish and pike.

On some lakes the season was reduced to a short period, owing to the limits being reached on some during January, and also to the late freeze-up during December. Limits were reached on Waterhen lake on December 28, 1927, with the result that the production for 1928 from that lake was all taken during December of the year. Keeley and Liston lakes closed on January 4; Deep river, Makwa and Ministikwan lakes on the 10th; La Plonge and Dore on the 14th; Peter Pond and Churchill on the 17th; Murray on the 24th, and Shagwanan on the 31st.

The winter operations opened from five to twelve days after the first of December and during the early part of the fishing season fishing was confined to the shallow water, as some lakes did not freeze over until December 20. This, in conjunction with the extended mild weather during January, made it a difficult year for the winter fishermen, with the result that the increase in the production, with an increase in fishermen, is lower than it would have been if normal weather conditions had prevailed.

There is an increase shown in the total production of whitefish of 2,344 cwt. This is an increase on Des Isles lake of 205 cwt., Isle a la Crosse lake 789 cwt., La Ronge lake 312 cwt., Turtle lake 138 cwt., Long lake 197 cwt., Churchill lake 4,283 cwt., and Murray lake 89 cwt. The 1927-28 winter limit was not reached on any of these lakes except Churchill and Murray, therefore allowing a longer fishing season. On Churchill the increase is due to a large increase in the number of fishermen operating during December, as is the case with Murray lake, where the number of men was doubled.

There is a decrease in the production of whitefish shown on Pierce lake of 30 cwt., on Makwa lake 135 cwt., Jackfish lake 51 cwt., Deep river 383 cwt., Candle lake 30 cwt., La Plonge 334 cwt., Peter Pond 727 cwt., Dore lake of 2,879 cwt., and Waterhen lake of 603 cwt. The 1927-28 limit was reached on all of these lakes before January 17, making a short fishing period during the winter season of 1927-28, except on Pierce, Jackfish and Candle lakes, where the decrease is only a small amount.

An increase is shown of 1,114 cwt. of pike, 882 cwt. mullets, and 1,023 cwt. of mixed fish, which is due largely to the shallow-water fishing during the early part of December on account of the deeper portion of the lakes being unfrozen. Isle a la Crosse lake alone increased 1,257 cwt., Churchill 214 cwt., La Ronge 52 cwt., Turtle 34 cwt., Des Isles 31 cwt., and Dore lake 52 cwt., with minor increases on other waters. Peter Pond shows a decrease of 302 cwt., and there were small decreases on other waters.

Sturgeon increased by 342 cwt., due to the production from the Churchill river being transferred from Manitoba to this province this year.

There is a decrease shown of 292 cwt. of trout from the previous year, accounted for as follows: Lac La Ronge decreased 20 cwt., Pierce lake 26 cwt., La Plonge lake 83 cwt., and Little Trout and Green, which are now within the National Park and on which no fishing is now allowed, 40 cwt.; and an increase of 238 cwt. shown produced on lakes located on the northeastern portion of the province credited to Manitoba previously.

Pickarel showed a decrease of 699 cwt., largely on Churchill lake.

Tullibee decreased in production on a number of lakes throughout the province to a total decline of 612 cwt.

SUMMER PRODUCTION

The summer production was 2,457 cwt., a decrease of 274 cwt. from the previous year. There is an increase shown in the marketed value of \$1,786. The decrease in production is due to no fishing on Jackfish lake and a decrease on Makwa. Owing to the limit being reduced, the prices obtained were higher than in the previous season. The high prices obtained for green winter-caught fish is having a great tendency to reduce summer production.

GREEN FISH

There were 2,934 cwt. of fish marketed during the winter season in an unfrozen condition. Of this amount 2,872 cwt. of whitefish, 20 cwt. of trout, 26 cwt. of pickarel, and 6 cwt. of tullibee were produced. This is an increase over the previous year of 863 cwt. All of this production was shipped from the district northwest from North Battleford and principally from Jackfish, Murray, Turtle, and Makwa lakes.

EQUIPMENT

The value of equipment used during the year was \$118,627, an increase of \$26,660 over the previous year. There has been an increase of 2,926 gill-nets, valued at \$37,865; four hoop nets valued at \$40; eighty lines valued at \$90. This increase is all due to more yardage of nets allowed, and also to an increase in the number of fishermen operating. There is a decrease of 25 piers, 30 ice-houses, 38 row-boats and 18 gas-boats, and 6 smoke-houses. This decrease is practically all due to the closing of Long lake and lakes in the North Battleford district against summer fishing.

CONDITIONS OF FISHERIES

The general conditions of the fisheries throughout the province are probably more favourable, due partly to the limit on most lakes. The result of stocking with whitefish fry during the past years is now becoming evident, especially on Jackfish and Okemasis lakes, where numbers of the fry planted during 1924 were taken, being easily distinguishable owing to the much brighter colour. Fox lake, Knee lake, and Frobisher lake, which are located north and west of Isle a la Crosse lake, have been opened up during the year and trails cut into them by the fish companies. This will result in other lakes being fished during the near future in that district. The only waters south of the North Saskatchewan river from which whitefish are taken are the small lakes in the Qu'Appelle valley, where restrictions may be necessary at an early date, due to the increased interest taken by anglers. Long lake is now closed for a period of three years, principally for the same reason.

Important information was obtained regarding Big Bear, Ballantyne and Deschambault lakes as a result of a trip made to that district by an officer. It was found that a trail has been established in the direction of these lakes by the railway survey line projecting from Nipiwán. This railway will open up a number of important fishing lakes and, with other proposed railways extending from Melfort and Prince Albert, will result in bringing important fisheries within a reasonable distance from the rail.

December was such an unusually mild month all through that it was feared the quality of the production might be lowered, but all fish were in a marketable condition; some were slightly discolored, due to a shortage of boxes and

the lack of snow to protect them from the weather, but there has been no wastage reported from any district. The mild fall did result in more unspawned fish being taken during the fall season. Operations were delayed some during December by weather conditions but, on the whole, the season was considered as favourable to all concerned.

The extra yardage of nets allowed during the year was appreciated by the fishermen. Requests were received to close some lakes located within reasonable distance from the railroads against summer fishing, that the total production might be taken during the winter season, in order to obtain the higher price offered for green winter caught fish. This not only allows a larger return to the fishermen for whitefish but it prevents a wastage of the coarser species that it is difficult to dispose of during the summer season, but can be frozen and marketed.

OBSERVANCE OF REGULATIONS

During the year there were 128 prosecutions and a conviction was obtained in all cases except four, resulting in penalties amounting to \$585 being imposed, and with additional court costs against the defendants of \$281.70 as follows:—

Fishing during closed season.....	45
Fishing with illegal apparatus.....	42
Fishing without a license.....	24
Fish in possession during closed season.....	9
Obstructing of Fishways.....	2
Destruction of fry.....	1
Fishing in prohibited area.....	1
	<hr/>
	124

There were also 111 confiscations made during the year, as follows:—

Legal apparatus.....	31
Illegal apparatus.....	49
Illegally caught fish.....	31
	<hr/>
	111

There were 29 sales of confiscated articles made during the year, amounting to \$197.76.

FISHWAYS AND DAMS

Repairs were made on the Cowan river dam by the Department of Public Works. The fishway is now in good condition.

The Canadian National railways have repaired the fishway in the dam on the Vermilion river near Vermilion, and also in the dam on the Carrot river near Melfort. The McLure dam on Round Lake creek was also repaired. The matter of repairing all fishways in dams on the Moose Jaw creek is receiving attention.

The Canadian National railways have removed the dam on the Carrot river at Ridgedale and also the dam on the Turtle river near Mervin, and the same company constructed a dam on Bear creek near Fort Pitt and installed a fishway.

DOMESTIC NET FISHING

There was a total production of fish taken under domestic net licenses of 15,449 cwt. during the year. This is an increase of 1,100 cwt. over the previous year and is largely due to including the production from the Peter Pond area, which was credited to Alberta during previous years. There was an increase of 123 domestic licenses issued. The matter of preventing commercial fishing from interfering with the local requirements of the residents is continually kept in view throughout the district.

ANGLING

The estimated catch as reported by the various fishery officers during the year was 22,292 cwt. of all species of fish. This is a decrease from the previous year of 847 cwt., though there was an estimated increase in the number of anglers of 299. The average catch per angler was 52 pounds of fish as compared with 54 pounds the previous year. A number of the smaller waters which were stocked years ago now afford fairly good angling. Considerable interest is being taken by the angling associations throughout the province in the protection of fish, which must be appreciated, and close co-operation between these various bodies and the fishery officers is being encouraged.

EXAMINATION OF WATERS

Twenty-one waters were examined in the district during the year by the officers to determine their suitability for fish. Of this number eighteen were reported to be suitable. Eight lakes were stocked by a transfer from other waters. Considerable assistance was given to the Fort Qu'Appelle hatchery officials in the moving of fry from the hatchery to the lakes, as well as in the transferring of fish from one lake to another during the year.

REPORT OF SUPERVISOR R. T. RODD, PROVINCE OF ALBERTA,
FOR 1928-29

During the calendar year 1928 there was an increase of 4,528 cwt. in catch over 1927. This was the greatest production yet caught in this province, but there was a small decrease in the value to fishermen. Increase is shown in the value as marketed due to the greater production of trout. This increase is chiefly attributable to lake Athabasca. Following are the details of this increase:—

	Quantity	Value to fishermen	Value as marketed
	cwt.	\$	\$
1927.....	67,267	434,903	712,469
1928.....	71,795	422,306	725,050
Increase.....	4,478	Decrease..\$12,597	Increase...\$12,581

In detail the increase shows 10 cwt. gain in goldeyes, 2,442 cwt. in mixed fish, 144 cwt. in perch, 1,753 cwt. in pickerel, 8,489 cwt. in trout, 1,652 cwt. in tullibee, and decreases of 751 cwt. of mullets, 3,816 cwt. of pike, and 5,335 cwt. of whitefish.

The number of employees for the year 1927 was 1,161 and for 1928 it was 1,401.

An increase will be noticed in the summer season (commercial) chiefly due to the successful operations on lake Athabasca.

Fishing was generally good in the summer in the larger lakes, lac la Biche fishing particularly well with a large proportion running to jumbo whitefish, for which good prices were obtainable.

Storms were again prevalent towards the late fall in Lesser Slave lake which affected fishing, and some of the fishermen complain of loss of equipment running to 100 per cent. Conditions at this lake, however, are fairly stationary and thus satisfactory.

Fishing as regards operations shows somewhat of a decrease, weather conditions being most unsatisfactory and unusual. Warm weather prevailed until

late December, and many lakes including Cold lake were unfishable owing to open water. Trails were in bad condition, owing to lack of snow, and operations were necessarily curtailed in all lakes some distance away from the rail.

To date (January 25, 1929) the issue of licenses, etc., is as follows:—

Angling permits.....	5,830
Commercial and fisherman licenses.....	1,064
Domestic licenses.....	252
Indian and half-breed.....	976
Total.....	8,122

INCREASES

Summer fishing shows a total increase of 1,145,000 pounds over that of 1927, attributable in a large measure to lake Athabasca and lac la Biche. The greatest increase in any one species was in the case of trout. It is very gratifying to note the splendid product now obtainable at lake Athabasca; substantial increase by way of new equipment and better and quicker facilities for marketing have assisted materially in the marketing of the fish from the lake and has contributed in no small measure to this increase. Lac la Biche fished particularly well, many of the fishermen using large sized mesh nets and the product from the lake was marketed at good prices because of the large size of the jumbo whitefish variety. Lake Wabamun also showed up well, both as regards winter and summer production, and owing to its proximity to the large towns had no difficulty in marketing every pound of fish at prevailing good prices. Much satisfaction is evident in this district with the good results of the limitation. During the winter season Primrose, lac la Biche, Pigeon and Wabamun, as well as lac la Biche, were steady in production with slight increases evident over 1927.

DECREASES

The winter fishing season was seriously curtailed through unseasonable weather, an amount of 689,200 pounds less than was reported for 1927 being shown. The principal lakes reporting a decrease were Lesser Slave lake; Cold lake, where boats had to be used and also because of new regulations confining fishing to within one mile of shore where skim ice had formed; Winnifred lake, a great decrease due to depletion and the heavy fishing of 1926 and 1927. It is considered on every side that the limits now placed on the lakes in this province are a necessary protective measure and that all the limits are fairly safe, and that, given good climatic conditions, all the lakes can safely produce the figures respectively set for them, without fear of depletion.

LAKE ATHABASCA

Operations at this lake area give cause for satisfaction. The fish are becoming a marketable product in increasing quantities, and progressive advertising being conducive of good results. A slicing machine was purchased by one of the companies, the trout being carefully sliced and frozen, then packed in wax paper, attractively branded and shipped. This has produced good results. The equipment on this lake has improved a great deal, two new steam tugs having been purchased, as well as two refrigerator barges. With the new equipment, together with new camps and refrigerators, there is no doubt that the Athabasca product is favourably considered in eastern markets. A projected fish reducing plant for coarse fish, mainly suckers, is one of the predicted developments on lake Athabasca for 1929. The canning factory at this lake is still not in use, but the equipment and the buildings have been repaired and are in use.

MARKETS

Spring prices were fair to average, except for lac la Biche fish, which marketed well. Local markets, on the other hand, were good, the dealers reporting good sales right through the year. The number of dealers is about the same, but peddling throughout the province has greatly increased, especially during the winter months when lack of other employments is evident. The catch from lake Athabasca was sold for fair prices.

The price for fall fish from Lesser Slave lake was good; the product from this lake is always well received in eastern markets and is well established.

The winter prices, owing to scarcity of fresh and frozen fish at the start, was very good, especially for the green fish, and owing to climatic conditions the frozen did not appear on the market in any great quantity until late in December. Whitefish naturally commanded the better price, averaging around 10 to 12 cents per pound, trout and then pickerel following closely. Stabilizing of prices naturally follows the limitation of the product and as no new lakes have been discovered or opened up there is evident a competitive buying of the fish available, hence the fairly good prices obtainable.

TRANSPORTATION

The transportation companies have always assisted earnestly in the marketing of the fish in good condition, and there has been no difficulty in obtaining refrigerator cars at all times. New refrigerator barges, new tugs, and refreezing plants are assisting and the Ottesen process of freezing is now in use at Edmonton. Trails were bad at the start of the winter season and, with the exception of lakes close to steel, the fish from far distances were not in as good condition as usual. Many of the lakes and trails were unfrozen until almost late December which naturally affected transportation. In lakes in settled districts trucks are being used more and more in bringing fish to the local towns and villages, and have been used during the past winter season in increasing numbers.

It will be noticed that the value of equipment now exceeds a half a million dollars in value. The equipment throughout the province is on a very high plane and of a high standard. Care is being taken to see that Alberta fish is carefully packed and selected before shipping to the more distant markets.

OBSERVATION OF THE REGULATIONS

As previously stated, the total number of licenses, permits, etc., issued from this office amounts to 8,122 to date, an increase over 1927 of 330, chiefly due to the better angling conditions, fair weather and closer checking of infractions. The large number of newly formed fish and game protective associations contributed naturally, and their valuable assistance is always evident. The number of prosecutions for the year amount to 72 and the number of confiscations 47. Details of prosecutions follow:—

- 14 Pollution of streams.
- 13 Fishing with illegal mesh nets.
- 10 Angling without permit and fishing without license.
- 9 Fishing with illegal apparatus (spears, etc.).
- 7 Fishing in close seasons.
- 4 Killing fish under the legal size.
- 4 Using dynamite.
- 3 Possession of fish in close season.
- 2 Angling in closed waters.
- 2 Not having license number on buoys and nets.
- 2 Fishing outside restricted areas (L. Slave L.).
- 1 Hanging fish contrary para. 2.
- 1 Obstructing a fishery officer.

Six persons were also prosecuted by the forestry officers for fishing in closed waters within the forest reserves, and five of these on a second charge of fishing in close season contrary to sections 79*a* and 85 of the forest regulations. Much assistance was given by both the Royal Canadian Mounted Police and the Alberta Provincial Police and also by the honorary guardians throughout the province, as well as by the undermentioned associations, many of which have only been formed during the year:—

Red Deer Fish and Game Association.
Medicine Hat Fish and Game Association.
Craigmyle Fish and Game Association.
Olds Fish and Game Association.
Didsbury Fish and Game Association.
Calgary Fish and Game Association.
Nanton Fish and Game Association.
Sheep Creek Fish and Game Association.
Midnapore Fish and Game Association.
Claresholm Fish and Game Association.
Delia Fish and Game Association.
Drumheller Fish and Game Association.
Hanna Fish and Game Association.
Banff Fish and Game Association.
Carstairs Fish and Game Association.
Macleod Fish and Game Association.
Carbon Fish and Game Association.
Hillcrest Fish and Game Association.
Pincher Creek Fish and Game Association.
Strathmore Fish and Game Association.
High River Fish and Game Association.
Camrose Fish and Game Association.
Cadogan Fish and Game Association.
Jasper Fish and Game Association.
Edmonton Fish and Game Association.
Vulcan Fish and Game Association.
Stavelly Fish and Game Association.
Bassano Fish and Game Association.
Brooks Fish and Game Association.
Coleman Fish and Game Association.
Lethbridge Rod and Gun Club.
Cardston Rod and Gun Club.
Killam Rod and Gun Club.

The Alberta Fish and Game Association was also organized during the year, the officers of the association being appointed from the executive of the smaller associations.

IRRIGATION SYSTEMS

Owing to the very heavy rainfall during the early part of the season, and sufficient showers to well on into August, no water was required for irrigation purposes for the growing crops; consequently, the smaller systems were not opened during the summer. The larger systems only drew sufficient water during the summer from the rivers to fill their storage basins and reservoirs, but, as the weather during the latter part of the season was extremely dry, considerable water was used to saturate the soil so as to have sufficient moisture to start next season's crop. However, no complaints have been received regarding destruction of fish.

DAMS AND FISHWAYS

A new dam was constructed by the town of Claresholm, in Willow creek, to replace the one carried away by high water last season. No fishway is required in this dam; a fishway, it is considered, would be more detrimental than beneficial to the trout fishing, as it would only permit pike and suckers to ascend to the trout waters.

A new fishway was installed in the dam in Bear creek at Grand Prairie.

All other dams and fishways were regularly inspected during the summer and were found in good repair at all times. The Calgary Power Company has a large dam now under construction in the Bow river, west of Calgary. This dam will form a lake several miles long, which will eventually develop additional fishing as well as create excellent boating and bathing for the people of Calgary. The same species of fish will be found both above and below the dam.

ANGLING

Angling throughout the province was on the whole much better than for the previous season, both as to sale of permits and the amount of fish taken, although at Cold lake there was a big decrease in the amount of trout taken and the number of permits sold. Only 630 permits were sold at this point as compared with 926 for the season 1927, and the amount of trout taken was 32,025 pounds as against 54,735 pounds taken by anglers in 1927. This decrease was not due to scarcity of trout in the lake, but to the bad condition of the roads for a great part of the season. It appeared for the first month or two, or even to the end of July, that there would be very little angling in any part of the province, owing to the continued wet weather which kept the roads in an extremely bad condition and the trout streams high and muddy. The roads in the Cold lake district were almost impassable from the end of May to the end of July, and the angling season at that lake ends on September 14. The anglers in the southern part of the province and in the Edmonton area and the district west were more fortunate. The angling season in the streams west of Edmonton, and in the Bow river and tributaries and all streams south to the United States boundary line, does not open until June 15 and ends on October 15 in the latter streams and October 31 in the former. Climatic conditions changed about the end of July and after that date there was very little rain in any part of the province. The roads became in excellent condition and remained so to the end of December. Anglers were enabled to travel into districts never before reached with motor cars, and while the angling season was shortened by rains in the early part of the season all anglers appeared to be well satisfied. The final result was an increase of over 600 in the total of angling permits sold over the season of 1927, and of some 160 over the season of 1926, when the largest previous record was made. The total amount of fish taken was almost double that of last season.

Angling for pike, pickerel, and perch was everywhere exceptionally good during the latter part of the season and until the lakes and streams froze up, which was very late owing to the exceptionally fine weather throughout the entire fall. Angling for goldeyes in the Sturgeon river and Red Deer was better during July and part of August than it has been for a great many years. Many very large fish were taken. As usual, good pike fishing was obtained in the lakes formed by the large irrigation systems, namely, Christena, Newall, Chin, McGregor, and Keho lakes. McGregor and Keho were the last formed and were only beginning to produce, but good catches were taken even in these.

Fair angling for rainbow trout and grayling was had in the streams tributary to the Athabaska and McLeod rivers, in the Edson district, west of Edmonton. Good catches of Loch Leven trout were taken from the Raven river, and

from the streams tributary to the Red Deer river that have been stocked with this species in recent years. Many reports have been received of great improvement in the trout fishing in the Bow, Elbow, and Highwood rivers; exceptionally fine catches of rainbow and cutthroat trout were taken from the Bow river east and west of Calgary, and the fishing in the Elbow was reported to be better than it has been for the last twenty-five years, about 65 per cent of the catch being rainbow trout. The fishing in the Highwood river still appears to be improving, in spite of the heavy fishing that is carried on all through the season. The fishing in the Old Man river and tributaries was also better than it had been for several years.

This improvement in the fishing is due to the continual stocking of the streams, stricter enforcement of the regulations, and better observance of the laws by the anglers. The many recently formed protective associations should be given considerable credit for the last condition as they are doing a great work in showing the public the necessity of the observance of the regulations.

EXAMINATION AND RESTOCKING OF LAKES

Ten lakes and streams were examined during the season with a view to stocking. Six lakes were stocked with perch and pickerel with good success. Four lakes were stocked with large-mouthed bass by associations and clubs at their own expense after permission to do so was obtained.

Good results are apparent from the stocking of several lakes in the Edmonton district with perch and pickerel in recent years.

Thousands of perch are now being taken from Mayatan lake, which was stocked with perch (forty-two adult fish in 1922). Great numbers of young perch can now be seen in Hastings lake, which was stocked with adult fish in 1925. Young perch can now be seen in Cottage lake and Sandy lake, which were stocked with perch three years ago, with a small number of adult fish. The pickerel placed in lake Nakamun have also done exceptionally well. The perch fingerlings placed in Whitewood lake in 1925 have now grown to over half a pound in weight. The results of the stocking of streams from the Banff hatchery have been most gratifying, resulting in improved angling each year.

REPORT OF CHIEF SUPERVISOR MAJOR J. A. MOTHERWELL WESTERN FISHERIES DIVISION (BRITISH COLUMBIA) FOR 1928

It is gratifying to be able to report that the salmon pack for 1928 was only 29,561 cases below the largest pack on record, being 2,035,637 cases, compared with the record total of 1926 of 2,065,198 cases. Unfortunately the sockeye total was considerably below the average of recent years, due primarily to the small packs on the Skeena and Fraser rivers. The whole province produced only 203,541 cases of this variety, compared with an average of the past fifteen years' totals, in five year periods, as follows:—

1914-1918.....	368,767
1919-1923.....	303,805
1924-1928.....	322,164

The Naas river has been gradually falling off in recent years. This undoubtedly is due to the intensity of the fishing operations along channels through which Naas river fish pass when proceeding to the spawning grounds; this applies particularly to the great quantity of fishing gear in Alaskan waters.

In the Skeena river area, owing to the fishing becoming more intensive than was felt to be in the interests of conservation, there was a weekly close season of sixty hours enforced during the entire sockeye fishing period. Judging from the excellent condition of the spawning grounds from a standpoint of parent fish,

this closed period accomplished the object desired, permitting the salmon to pass upstream, and was undoubtedly a large factor in the small catch. The poorer pack cannot be accepted as evidence that the run is becoming depleted, but, on the contrary, the small total, together with the conditions on the spawning beds, testifies to the efficacy of the system at present in force for the purposes of conservation.

In the Fraser river district in the years 1926 and 1927 a very late run of sockeye appeared and accounted for a considerable percentage of the total pack in that area. In 1928 this late run did not materialize.

At Rivers inlet the catch was disappointing, although the conditions on the spawning grounds could not be said to be at all alarming. There was an abundance of five-year-old fish, but a considerably smaller proportion of the four year variety, due, undoubtedly, to the unusually severe freshets of 1924 which scoured out large portions of the spawning areas and destroyed the eggs. Another factor which contributed to the small pack was a week of cold and dark wet weather during the time the salmon were running. Such a condition results in salmon seeking the lower depths and so escaping the nets.

At Smiths inlet the conditions were most gratifying. The pack was 33,289 cases and immense quantities of spawning sockeye were able to pass up safely to the spawning grounds. With the enforcement of the present regulations there is not a doubt that the run to this area can be maintained indefinitely.

The pack at Nimpkish river was somewhat below the average, but there was a splendid supply on the spawning beds. The regulations at this point are taking care of the situation.

Again there was an excellent run of sockeye in the Barclay sound area and there is every reason to believe that the efforts in recent years, by means of fish cultural operations and prohibition of fishing, have restored to a considerable extent the runs, particularly to the Stamp and Sproat river areas. The recently constructed fishway at Stamp falls has been an entire success and no fish has any difficulty in ascending.

In the case of spring salmon the statement of quantity packed is no indication of the run, since an increased proportion is utilized each year for the fresh and frozen fish business.

The remarks with regard to the spring variety also apply to a certain extent to cohoes. A considerable percentage of the catch is used for cold storage or fresh fish purposes. The pack of 150,684 cases for 1928 is very satisfactory, in view of the large quantity used as indicated above.

Comparison of this year's total of cohoes with that of the past fifteen seasons in five-year periods, is as follows:—

1914-1918.....	159,887
1919-1923.....	121,964
1924-1928.....	155,786

The pink total of 792,362 cases is the largest on record, exceeding that of 1926, the previous record year, by 19,369 cases. This total no doubt would have been materially increased had it not been for the restrictions placed on fishing at such points as Masset inlet, where Justkatla inlet was closed all season with the exception of one and a half days. It is in this inlet that in past years a very large percentage of the catch has been taken. The supply of pinks running to the Naas and Skeena river areas was surprisingly large, and, in fact, the same condition obtained through the greatest portion of the province, apart from such areas as the Fraser, where no run was expected, due to 1928 being the "off" year.

In the central area, the run was splendid, as was the case in Bella Coola and Fisher channel. At Oyster river and Courtenay river, on the east coast

of Vancouver island, the quantities observed were unusually large. The quality in practically all cases was above the average and resulted in a high grade of the canned product.

Pinks mature in two years and the following is a comparison of the average catch for the past twelve seasons in two-year periods:—

1917-18.....	512,252
1919-20.....	433,741
1921-22.....	387,442
1923-24.....	549,246
1925-26.....	609,196
1927-28.....	519,990

In the case of the chums, the year's pack was also a record, exceeding that of 1926, the previous record, by the large total of 161,294 cases, notwithstanding the large quantity frozen and used fresh.

The comparison of this year's pack with that of the previous fifteen years, in five-year periods, is as follows:—

1914-1918.....	295,912
1919-1923.....	240,866
1924-1928.....	661,145

In the light of these large catches of chums and pinks, the impression might prevail that far too great a proportion of the runs had been taken, but this was not the case, and, as a matter of fact, the fishery officers report that they had, during the season, observed pinks and chums in numerous streams in which they had never, in their experience, been observed before. Nineteen hundred and twenty-eight was a banner year for pinks and chums, and notwithstanding the large packs the spawning areas have been well seeded.

Comparison of this year's total pack of all varieties with that of the past fifteen seasons, in five-year periods is as follows:—

1914-1918.....	1,282,625
1919-1923.....	1,163,265
1924-1928.....	1,785,882

The very large percentage of the pack of pinks and chums is taken by means of purse-seines, which increased from 92 in 1912 to 555 in 1925, but numbered only 397 in 1928. The reduction in the year under review was due to the action of the department in taking very drastic measures in 1927, the year of the most intensive fishing, to the end that, even though the catch might be curtailed to the point where profit to the industry was impossible, the salmon runs would be conserved. The year 1927 was the peak one from the standpoint of the quantity of fishing gear in the water, and the industry realized, the following season, that unless the fishing intensity was very greatly relieved the restrictions placed on fishing operations would be further increased.

One result of the action of the department was the getting together of the canning industry, and the arranging, by means of what has been known as the "Canners' Agreement of 1928," to reduce the number of purse-seines fished. This agreement actually was the cause of a reduction of the number of purse-seine licenses issued from 555 in 1927 to 397 in 1928, or a decrease of 158. In addition, the agreement, together with the amalgamation of two of the largest canning companies, permitted the closing of fourteen salmon canneries with the resultant saving of that much overhead expense in canning operations.

Due to the aforementioned canners' agreement, fishing by means of purse-seines was largely confined to areas within reasonable distance of the canneries for which the seines were operating. This, in turn, resulted in shorter hauls and the salmon being in decidedly fresher condition when ready for canning. The higher standard of pack, as a consequence, has been the subject of considerable comment by brokers and others, through whom the product passes to the consumer, and if maintained it should be the means of bettering market conditions very materially for British Columbia canned salmon.

It is interesting to note that the British Columbia salmon pack of 1928 was distributed in the markets of more than twenty-five foreign countries, the larger portions being consigned to France, Australia, and the United Kingdom, in the order mentioned as shown by the following statement:—

	Cases
Australia.....	269,029
Belgium.....	53,296
British India.....	2,630
Central and South America.....	90,421
Ceylon.....	1,200
Greece.....	685
Denmark.....	1,080
Dutch East Indies.....	4,371
China.....	10,035
Egypt.....	1,375
Fiji.....	16,386
France.....	333,670
Germany.....	19,067
Holland.....	34,340
Italy.....	40,400
Japan.....	140
Malta.....	535
Philippines.....	15,690
South Africa.....	50,044
Straits Settlements.....	3,770
Sweden.....	575
United Kingdom.....	257,970
United States Atlantic coast.....	14,552
West Africa.....	5,033
West Indies.....	13,102
Unclassified.....	19,894
	<hr/> 1,259,290

Halibut

As was anticipated, due largely to the heavy stocks of frozen halibut in cold storage, the fishing of the season 1928 opened with prices which were not particularly attractive to the fishermen. The catch of 30,282,000 pounds landed at British Columbia ports was not behind the average of recent years, and without some restriction other than the present closed season there would appear to be reason to expect that if conservation demands a lower catch each season, the situation cannot be successfully met by present conservation measures.

The market for the cold storage product during 1928 improved somewhat, and it is anticipated that conditions at the commencement of the season of 1929 will result in better prices to the fishermen.

HERRING—DRY-SALTED

The pack since 1918 of this product is shown by statement No. 8. The quantity drysalted in 1928 was the largest of which there is any record. This was due largely to the excellent run to the east coast of Vancouver Island. It has been claimed that the intensive fishing of herring was resulting in the serious depletion of the runs and the east coast of Vancouver island in past years has been used in an endeavour to illustrate this contention. The experience of recent years, however, would seem to show that there is no ground for any alarm from the standpoint of depletion. The quantity taken each year can be only infinitesimal compared with the large quantities off the shores of British Columbia. Herring are more or less uncertain in their runs, although not to the same extent as pilchards, and a small run in one locality in one season is no criterion that the supply is becoming less. The statistical year covered by this report ends on the 31st December, but the runs of herring commence in the fall and continue through until late spring. The result is that the annual report covers the last period of one run and the first of the next.

Drysalt herring is practically all used in China. The market of recent years has been somewhat uncertain owing to the disturbed condition of that country, resulting in a boycott of any product suspected of being of Japanese origin, or with which the Japanese are suspected of having anything to do. As a portion of the drysalt herring pack is put up by Japanese operators, and a larger portion still is marketed through Japanese brokers, the situation recently has been a somewhat difficult one.

PILCHARDS

Statement No. 9 gives the quantities of pilchards canned since the year of commencement, 1917. During the years 1918, 1919 and 1920 a reasonably profitable market was found, particularly in Australia and the United States, but in later years the fall grades of salmon, particularly the chums, have replaced the pilchards to a large extent. The market, however, is improving, and it is confidently expected that this canned product will always find a ready market for a reasonable quantity.

WHALING

The catch during the year will be found in statement No. 11.

Operations were conducted from two stations only, that at Rose Harbour at the south end of the Queen Charlotte island group and the station at Naden harbour on the north coast of Graham island, in the Queen Charlottes. Four steamers were used in connection with the Rose Harbour operations and two at Naden harbour, the hunting areas extending in a radius of from eighty to one hundred miles about each station. In addition, one tender vessel was employed for carrying oil and supplies.

FUR SEALS

Statement No. 12 shows the number of fur seals taken off the west coast of British Columbia by Canadian Indians under the terms of the Pelagic Sealing Treaty, whereby native Indians are permitted to hunt from canoes propelled entirely by oars, paddles, or sails, and manned by not more than five persons each. Firearms are prohibited. The average price for skins during the year was \$6 as landed.

DESTRUCTION OF SEA LIONS

Operations under this head were extended during 1928 to include Solander rock, which is situated on the west coast of Vancouver island in the vicinity of Cape Cook, as well as the Virgin and Pearl rocks, off the north end of Vancouver island. The C.G.S. *Givenchy*, equipped as usual, and with Mr. W. E. Maiden, secretary of the British Columbia Fishermen's Protective Association, again in charge of machine gun operations, left Esquimalt on May 28.

The hazardous conditions found in previous seasons' operations were again experienced, and even to a greater extent at Solander rock. It is only under very exceptional conditions at this point that it is possible to put a landing party ashore. The difficulties are such as to raise a doubt as to whether it would be wise to continue operations there. It is the intention to try one more season and if operations are found too difficult the Solander locality will be eliminated from the following year's itinerary.

At this point no pups were observed, although there was found to be a fair number of adults, 103 of the latter being destroyed. It is possible this total might have been increased, except for the fact that the *Givenchy* was obliged to hurry away on an urgent call to search for the survivors of the gas boat *Petrel*, which was wrecked on the rocks in the vicinity.

Both adults and pups were found on the Virgin and Pearl rocks. The absence of yearlings was again very noticeable, and, in fact, the condition of the whole rookery was altered very materially since operations were commenced in 1922. There is no doubt that the hunting is having the desired effect of reducing materially a great menace to the sockeye fishing off Rivers and Smiths inlets.

Demonstration of approval of these operations was made by several of those persons interested at Rivers inlet. One resident fisherman of Cape Scott, at the north end of Vancouver island, suggested that the work done by the *Givenchy* crew means to him personally \$100 to \$150 per year.

Statement No. 13 shows the number of sea lions, adults and pups, killed each year since the commencement of operations.

PRODUCTION OF FISH OIL AND MEAL

The year under review has been a record one, as will be observed by statement No. 10. Due to the department's policy of permitting the pilchard to be utilized for the manufacture of oils and meal, twenty-three plants have been built in the last four years, providing employment for a very considerable number of citizens and producing a product valued at \$2,241,561 during the calendar year 1928.

The pilchards this year were found to be unusually fat and produced a large percentage of oil. It is possible that this was due to the fact that fishing operations have been conducted more extensively each year in outside waters, where the fish are usually found to be in better condition. It is interesting to note that a small percentage of Spanish mackerel was also obtained in the pilchard seining operations. These were not separated but were passed through the reduction plants with the pilchards.

Herring was again permitted to be used in the manufacture of fish oil and meal on that portion of the west coast of Vancouver island north of Barclay sound. Neither the supply nor the condition of these herring, generally speaking, was found to make operations profitable.

PATROL SERVICE

Each season the necessity for a greater number of permanent overseers with smaller districts becomes more and more apparent. It is confidently expected, however, that this situation will be met in the near future.

The total number of boats utilized during the year for the protection of the fisheries was 133. Twenty-five were departmentally owned and 108 were chartered for periods of from one to six months. The *Malaspina* and *Givenchy*, the two steam trawlers, were kept constantly employed as usual in connection with the halibut fisheries, the protection of fur seals, protection of Canadian harbours, and other related work. The *Givenchy* was again stationed at Bamfield for thirteen days in connection with life-saving duties. In this connection it is pointed out that this life-saving duty comes at a most inconvenient time, as it is impossible to arrange for the annual overhaul until this special work is finished. The result is that the annual repairs must be performed during the halibut fishing season, when both boats are urgently required for patrol. Particularly in view of the fact that foreign boats are utilizing Canadian harbours on this coast more and more each year in connection with fishing operations, it is absolutely impossible for two boats to take care of the situation at all times. The great increase in the number of foreign salmon-trolling boats operating in Hecate strait and off the west coast of the Queen Charlotte and Vancouver islands demands better facilities for the protection of Canadian

waters and harbours. It will be observed that both trawlers have been very busy during the year, the *Malaspina* logging 19,962 miles and the *Givenchy* 18,955.

During the year three new 52-foot patrol boats powered with Thorneycroft 60-horsepower reduction-gearred gas engines were built. These have proved to be an extremely valuable addition to the patrol fleet. The plans and specifications were prepared by Mr. J. W. Allen, of the British Columbia staff, who is responsible for the care of patrol boats other than those propelled by steam. The performance of these new craft has been most satisfactory. The use of reduction-gear is the means of more economical operation, less vibration and reduced noise.

SEAPLANE PATROL

A two-year contract was entered into by the department with the Western Canada Airways, Limited, calling for 400 flying hours each year for the purpose of fisheries patrol, which has been found so effective in the past. Owing to unfortunate accidents only 261½ hours were used during 1928. Most of the flying was done by means of the Boeing BID flying boat, equipped with Wright Whirlwind engines of the latest type. These were found to be very efficient and comfortable.

In connection with the seaplane service are reported, with regret, two accidents. The first occurred on July 13 about four miles southeast of Butedale, when a Boeing crashed, injuring the pilot and killing the mechanic. Again, on August 15 the Vickers-Vedett G-CASW crashed in the fog on the mountain at the north end of Porcher island on the way to the Queen Charlotte islands. The pilot suffered severe concussion and the other two occupants received slight cuts and bruises.

REGULATIONS

Owing to the runs of salmon, generally speaking, being more satisfactory and the amount of fishing gear in the water having shown a reduction during the year, it was not found necessary to curtail fishing operations in such a drastic manner as in the previous season. By statement No. 1 the following percentages of reduction will be observed in salmon fishing licenses covering the whole province:—

Gill-nets.....	8 per cent.
Trolling.....	3 “
Purse-seines.....	28 “
Drag-seines.....	52 “

In the Skeena river salmon fishing, owing to the number of licenses exceeding that set by the department for a weekly close season of forty-eight hours, an extra period of twelve hours was enforced from the 1st July, making a total of sixty hours each week during which no fishing was permitted.

In view of the considerable increase during recent years in the number of salmon purse-seines operating in the province, it was considered imperative that the regulations be amended in such a manner as to fully protect a number of areas in which conservation measures have been difficult in the past. The resultant amendments to the regulations reserved a very considerable number of areas entirely from purse-seining operations and no doubt this action will in future years be found to be fully justified.

Boundaries also were moved out farther from the mouths of spawning streams. In some cases this was done by regulation and in others by the moving of the boundary signs by the local fishery officers. As a result of these precautions fishing operations each year are confined to areas farther removed from the mouths of spawning streams and, in addition to the fish receiving better protection, those which are caught are in much better condition for food purposes.

Salmon trolling operations have become such a large factor in the catch of springs and cohoes that the time would seem to have arrived when some action should be taken looking to increased restrictive measures being enforced. No action in this connection has been taken up to the present time, owing to the fact that it was felt that weather conditions were such as to make weekly close periods unnecessary. Another reason has been that Canadian and foreign trollers operate together in considerable numbers in extra-territorial waters, and it would seem unreasonable to curtail the fishing operations of Canadians while others are permitted to fish. It is expected that in the near future some arrangement will be made whereby the operation of both Canadian and foreign boats will be controlled.

Owing to the uncertainty as to the federal department's jurisdiction over the plants processing fish after they have been caught and killed, four salmon canneries and four reduction works plants operated without obtaining licenses from the federal department.

VIOLATIONS OF THE FISHERIES REGULATIONS

A total of 176 prosecutions during the year for violations of the fishery regulations is covered in the British Columbia section of appendix No. 12. The revenue collected as a result of these prosecutions amounted to \$7,308.88.

SPORT FISH

The efforts being made to conserve and improve the sport fishing in the waters of the province have been extended each year. Close attention is given by local officers in the way of inspection of the several streams and lakes in their districts and the better enforcement of the regulations. With a view to providing greater attraction in the streams and lakes, which have, through several reasons, become partially depleted of sporting fish, 201 plantings of eggs and fry were made during 1928. Residents of the province are very appreciative of the efforts being made by the department, and as a rule are eager to give any assistance in their power. In this connection the British Columbia Fish and Game Protective Association of Vancouver, representing thirty-seven angling associations throughout the province, has been of immense assistance. By means of this central organization it is now possible to deal with only one association instead, as in the past, with numerous ones scattered throughout the province. Under present conditions suggested amendments to the regulations or suggestions for the improvement of conditions in other ways pass through the hands of the central organization and reach the fisheries department only after having been thoroughly investigated and finally endorsed by the central body.

TAGGING OF SALMON

It is regretted that it has not been possible to greatly extend these most important operations. Each year the necessity becomes more and more apparent and until there is available the information which can be obtained only as a result of tagging, it will never be possible to regulate the salmon fisheries satisfactorily.

CLEARING OBSTRUCTIONS IN STREAMS

Under this heading appears on another page the report of the Engineering Department with regard to the work accomplished during 1928, under the direct supervision of Engineers McHugh and Hunt. Attention is particularly directed to the reports of the Board of Engineers on conditions at Hells Gate and at Bridge river, two difficult points on the Fraser river.

During the year evidence was again very abundant showing the unfortunate results of logging operations along the banks of salmon streams. Before the timber was cleared off, these streams contained an ample supply of water all the year round, but under present conditions it is found that, particularly during the warm summer months, when the first runs of early salmon arrive, in many cases there is not sufficient water in the streams for the salmon to pass up to their spawning grounds. This condition has necessitated very drastic regulations with a view to controlling the fishing in the vicinity of these streams. There would appear to be little, if any, reason to expect that conditions in this respect will improve in the future. As logging operations are extended more streams are affected, and the situation in some districts, particularly on the east coast of Vancouver island, has become very difficult.

POWER BOATS IN DISTRICT NO. 2 SALMON GILL-NET FISHING

The number of power boats being used in the salmon gill-net fishing of the northern district has been increasing steadily since they were first permitted in the year 1924. Statement No. 16 shows the increase each year. It was the custom, prior to 1924, for the salmon canneries to provide in District No. 2 the boats for salmon gill-netters. These were of the skiff type, which contained no cabins and were propelled by means of oars or sails. They were supplied to the fishermen on a rental basis. The labour in operating these skiffs in comparison with that in connection with the modern power boat is very arduous and there is no shelter provided for the fishermen apart from a tent formed by hanging the sail over the boom which was fastened along the centre of the boat from stem or stern. The cost of the power boats is infinitely greater than that of the skiffs but they are considered by the fishermen to be more efficient and are undoubtedly much more comfortable. By means of these power boats several drifts can be made in the time required to make one by means of the boats propelled by oars or sails. The permission to use the power boats has assisted particularly those fishermen who own their own, and as a rule the fact that a fisherman does own his own power boat is evidence that he is a good fisherman and as a result he is in demand.

MEETING OF FISHERY OFFICERS

The usual annual meeting of the permanent fishery officers of the province was held at the office of the Chief Inspector in Vancouver.

STAFF

The following statement gives particulars of the staff employed during the year in the administration of the fisheries of the province:—

Inspection and clerical staff.....	27
Overseers.....	17
Guardians.....	39
Patrolmen and boat crews.....	229
Fish culture.....	86
	<hr/> 398

INSPECTION OF SPAWNING GROUNDS

Queen Charlotte Island

The season of 1928 was the big year for pink salmon in the Naden harbour and Masset inlet districts. Reports of the inspecting officers show that there was again an excellent run of this variety. Virago sound and Naden harbour streams, particularly, received large quantities of spawning fish. These areas show an improvement over 1926, the brood year.

The Masset spawning grounds were also found to be well seeded. This is particularly so in the case of the Yakoun river where large quantities of pink salmon were found all the way up to the Yakoun lake. Also in the Mammon river which is the chief spawning stream of Justkatla inlet, large quantities of pinks ascended. The run to the Ian river was not so good during the fishing season, although, as in the case of the Yakoun and Justkatla inlet streams, splendid runs came in after the fishing was closed and proceeded to the spawning grounds without molestation. While the Masset area was satisfactorily seeded, it is estimated that the quantity was not quite as large this year as in the brood year of 1926.

As a conservation measure Justkatla inlet was closed all season, with the exception of one and one half days. It is here that in the past very large quantities of fish have fallen an easy prey to the numerous purse-seines. It is felt, however, that with the closing of the area all or most of the season, together with the present fishing boundary being enforced at the mouth of the Yakoun river, there need be no fear as to the future supplies. It is worth mentioning here that the quality of the pinks which run to the Yakoun river is not surpassed anywhere on the coast.

In the pink streams along the east coast of the Queen Charlotte islands, the quantity of pinks found on the spawning grounds was satisfactory. In the case of the chums, apprehension felt at certain times during the fishing season that there would be an insufficient quantity, and that the water in the streams would be too low to permit of their ascending to the spawning grounds, was found to be ungrounded. The rains came in time and very considerable quantities of chums arrived towards the end of the fishing season and after the fishing operations were closed.

On the west coast of the Queen Charlottes, owing to the waters being unsurveyed and exposed to the whole sweep of the Pacific ocean, conditions are such as to prevent intensive fishing apart from that portion from Skidegate inlet north to Dixon entrance. All along this coast weather conditions are a considerable factor in the protection of the runs, and it is felt that with, possibly, the closer supervision of the northern part of the west coast, the runs will be well protected.

Naas River

Conditions on the spawning grounds of the upper reaches of the Naas river area, namely Meziaden lake district, were found this year to be the most discouraging on record, and coincided with those found by the fishermen during the run of sockeye. Sometimes, owing to weather or other conditions at the time inspections are made, the information obtained is not complete. In judging runs during the fishing season it is not always safe to use the catch as unassailable evidence, owing to the difference in weather and tidal conditions and also variation in close periods for fishing. Neither of these factors, however, would appear to enter into the present case and there is no doubt whatever but that the sockeye run on the Naas river this year has been practically a failure.

The supply of spring and coho salmon also was found to be very disappointing.

The pink run was a very good one, generally speaking. Heavy runs entered Salt lake stream, the main stream at the head of Wark channel, the stream at the head of Quattoo, Dogfish bay, Quinamas and Trout stream, Kincolith.

Chums were only fairly plentiful.

The upper fishing boundary is being moved some six miles nearer salt water and this measure should assist materially in conservation.

Skeena River

The main sockeye spawning grounds on the Skeena water-shed are those of the streams tributary to Babine lake. Judging from the disappointing pack on the Skeena river, some doubt was felt as to there being a satisfactory quantity of parent fish on the spawning beds. A close inspection, however, has shown a very satisfactory condition in this respect. The inspecting officer gives assurance that all spawning areas were abundantly supplied with sockeye, and will be well seeded. Encouraging reports also have been received from the Bulkley river district, particularly the earlier runs. The poorest indications found were those at Lakelse lake, but even at that point conditions improved as the season advanced, although it was not up to expectations. Owing to a freshet in William creek a considerable number of sockeye were able to escape above the fence and were lost to fish cultural operations, although they spawned naturally. This resulted in it being impossible to fill the hatchery to capacity. There is no doubt, however, but that this season's supply of sockeye at Lakelse lake has not been up to average.

One outstanding feature of the Babine lake sockeye this year has been the large percentage of runts. Mention has been made of these in previous reports, but indications would seem to show that their proportion is increasing. It is to be hoped that the amendment to the regulations which will eliminate for the future the minimum size of mesh for sockeye gill-netting will result in considerably reducing this high percentage.

The Oestahl river inspection showed an average quantity of sockeye, but only a fair supply of springs. On the other hand, there was a good run of cohoes. The chum seeding was an average one.

There is no doubt but that the sixty-hour weekly close season, enforced owing to the increased number of gill-nets fishing the Skeena area, was largely responsible for the salmon getting through the danger area and arriving safely on the spawning grounds. This method of conservation is undoubtedly a very efficacious one.

Undoubtedly, spring salmon were scarce in the Skeena and it cannot be attributed to the operations of the gill-nets, there being so few fishing for this variety of salmon. It would seem reasonable to lay the blame to the operations of the salmon trollers who fish practically the whole year round in territorial and extra-territorial waters. The fleet of both American and Canadian boats has been increasing quite rapidly of recent years and their catch has been a very considerable factor in the quantity marketed.

Generally speaking, the run of pinks to the Skeena district was a heavy one and the spawning grounds are well seeded.

Chums were not particularly plentiful.

Central Division

The central division is primarily a fall salmon area, although a considerable catch of creek sockeye is made each year. On the whole, weather conditions were generally favourable during the fishing season, the streams being full, which permitted the salmon to reach the spawning grounds. It is in this area, particularly, where so much difficulty has been experienced in some seasons in protecting the pinks and creek sockeye until the rains come. In a normal season, however, there is no difficulty. During the year just closed, pinks and chums spawned in many small streams where salmon have never been observed previously by the local officer.

The runs of pink and chum salmon were exceptionally heavy, and there is no doubt that the spawning beds have been well taken care of. The quantities found on the spawning grounds this year exceeded those of the season of 1926, the brood year for pinks, for instance, and that year was an exceptionally good one for both pinks and chums.

No doubt, other factors in bringing about this favourable condition have been the closing of certain areas from time to time, and the moving of the fishing boundaries farther out from the mouths of creeks. The sockeye streams were not found to be quite as heavily seeded as in the preceding season, but are considered as fairly well stocked.

Bella Coola

On the whole, the seeding of the spawning grounds in the Bella Coola area may be considered to be very good, the only exception being the Kimsquit river sockeye and the pinks in the lower Dean channel area. Sockeye to the Bella Coola and Atnarko rivers arrived early and a considerable quantity passed up the streams before fishing commenced. The seeding of the streams with this variety was well up to the average. The spring run was only fair but the coho run, on the other hand, was a good one. The local officer states that the run of pinks was the heaviest on record, exceeding by far anything he had experienced. The chum supply was very fair.

At the Kwatna river there was a medium supply of chums and coho and a satisfactory supply of pink salmon on the spawning grounds. In the Nootum river were found good supplies of pink and coho salmon; in fact, the former were considerably more numerous than for some years past.

At the Kimsquit river the supply of sockeye was not particularly encouraging, although estimated to be not greatly below the average. The run of springs is not usually an important one and the supply of cohoes was found to be light. The pinks, on the other hand, were more numerous than usual. These remarks also apply to the chums.

The run of fall salmon to the streams along Dean channel was not particularly good, but this year all the inlets along both sides have been eliminated from the seining areas, which should go a long way towards maintaining the runs. It is felt that this measure also had some bearing on the quantities of salmon reaching the head waters at both Dean and Burke channels, the seines being obliged to fish in the open channels and not in the bays or inlets, favourite schooling places for salmon.

The most important stream in Fitzhugh sound is the Koeve river. The spawning grounds were found to be splendidly seeded with pinks; in fact, it is one of the best pink rivers in the province and the quality is unusually good. A run of sockeye also ascends but is not of so much importance. Conditions on this river during the season were found to be average.

Outstanding features of the fall's inspection were satisfactory, supplies of pink salmon in the Bella Coola and Koeve rivers and chums showing better all through the district than for several years, generally speaking.

Rivers Inlet

Two inspections were made by Overseer Boyd of the Owekano district, one, commencing September 22, covering the streams at the head of the lake, the other, commencing October 24, being confined to the streams lower down.

The streams covered by the first inspection are the Wak-wash, Cheo and Indian rivers but stops were made also at Genessi and Askum rivers.

On the Wak-wash, examination of the spawning beds showed large numbers of sockeye both dead and spawning, and indications also showed a satisfactory run of springs. The sockeye were estimated to be 60 per cent large and 40 per cent small fish.

On the Cheo, which is close to the Wak-wash, many sockeye were also found on the spawning beds, although the area is quite small. The salmon were mostly of the larger variety.

On the spawning grounds of the Indian river large numbers of sockeye were found and a satisfactory quantity of spring salmon.

At Genessi and Asklum rivers the overseer reports having seen numerous sockeye showing at the mouths of the streams, but that they had at that date not entered. On the second inspection, on October 26, the run was found to be about over. The former is the stream from which the hatchery obtains a portion of its eggs. More were taken in 1928 than in 1927.

The second inspection of the Asklum on October 30, showed a medium run of sockeye.

Apparently the sockeye salmon do not spawn in the Markwell river, which is of glacial origin; also, owing to the muddy state of the water, it is impossible to make any intelligent observations. Similar conditions prevented any reliable information being obtained with regard to the run to the Shumahault river.

At the Quap river quite a satisfactory run of sockeye was found, although perhaps not as good as in the previous season.

The overseer feels that compared with other years the run of five year fish was probably up to average, but that the run of the four year variety was approximately 30 per cent short. There is every reason to believe that the cause of this shortage has been the unusually heavy freshets of the season of 1924, which undoubtedly destroyed large quantities of sockeye eggs. This matter at the time was reported by the superintendent of the hatchery.

In the opinion of the superintendent of the hatchery, the run of sockeye to the spawning grounds of the Rivers inlet area this year has been below the average, but there has been no alarming scarcity of this variety.

It will be remembered that the pack on the inlet was much smaller than anticipated, but, owing to some bad weather in the middle of the best fishing and the depth of the water in the inlet, a very satisfactory percentage of the run succeeded in passing the nets.

Smiths Inlet

Indications on the spawning grounds of this area during recent years leave no doubt as to the efficacy of measures taken looking to conservation. The inspection this year showed that there was a splendid supply of parent sockeye on the spawning grounds, and with the present regulations properly enforced there would appear to be every justification for optimism when considering Smiths inlet conditions.

One notable feature is the large number of big fish which were undoubtedly five years old. The supply of these was greater than the smaller, four year old fish, but returns from both varieties should be quite satisfactory.

Spring salmon were also found to be very plentiful, although the variety is not a particularly desirable one, the fish being very large and coarse.

Alert Bay

The local overseer reports that all the streams in the Alert bay district have had a good supply of salmon. He comments on the good results of moving the fishing boundary signs farther out from the mouths of creeks.

The Nimpkish river is the main sockeye stream and the run in 1928 was a good average one, although a smaller proportion was caught. The spawning grounds were well seeded.

This being the off year for pinks in the district, there were few to the Nimpkish. There was a good run of cohoes, however, and also of chums. Springs arrived in average quantities.

Glendale river produced an average run of sockeye and a very heavy run of pinks. The chums also arrived in very large quantities.

On the whole, the supply of chums was found to be quite good and, in certain portions of the district, excellent. In practically all portions of the district the supply of chums was splendid and the quality good.

Quathiaski District

In the Quathiaski district the principal varieties of salmon are those which run in the fall, although there was quite a good supply of sockeye to Heyden bay. These are a very small variety, however. The run to Phillips arm was not up to the average, but it is never a very heavy one. On the whole, the run of cohoes was an average one and in some points considerably better. As far as pinks are concerned, 1928 was an off year in the greater part of the district, and no big run was expected.

In the case of chums, the run on an average was a good one and the spawning areas were mostly well seeded.

At the Campbell river, where the famous tyee salmon fishing is found, the supply showed some improvement over the previous year and sport fishermen coming from a good many parts of the world made some good catches.

Pender Harbour

Pender harbour is not a sockeye area apart from the Sauchenauch system, where, owing undoubtedly to the unusual measures taken during recent years in the way of conservation, the run was the best in the last four or six seasons.

A good run of pinks was not expected owing to the even numbered years being the off ones as far as this variety is concerned in this district. The supply this year, however, was better than the brood year, 1926.

In the case of chums the run was very heavy, and every stream, no matter how small, received its share.

The cohoes were found in fairly satisfactory quantities on the spawning grounds, although the run did not appear to be as large as usual. The overseer feels that the moving of the fishing boundaries out farther from the mouths of streams has resulted in a larger percentage of fish being able to ascend to the spawning grounds.

Comox

In the case of those pink streams in the Comox district which have been in the past frequented to any appreciable extent by this variety, they were found to be well seeded and, in fact, the Oyster and Puntledger received excellent supplies of pinks. The quantity of cohoes on the spawning beds through practically the whole area was found to be good, with some exceptions as usual.

The chum streams received a very good supply of spawning fish and at Big Qualicum, Little Qualicum and Englishman's rivers, for instance, the run was very heavy.

The closing of a large part of Baynes sound to all net fishing and the moving of the boundary two miles out from Oyster, Black, French and Englishman's rivers, undoubtedly resulted in a considerably larger quantity of salmon escaping upstream. This conservation measure has been well justified.

Nanaimo

The Nanaimo district is a fall salmon area, principally coho and chum. The supply of the former was below average, but the quantity of the latter found on the spawning grounds is reported to have been the best for the past ten seasons. This applies particularly to the Chemainus river where efforts have been made to have the fishing area closed for the benefit of sport fishermen.

Cowichan-Victoria

The local overseer for the Cowichan-Victoria district feels that the spawning conditions found in his area are average or even better this year.

The Cowichan is the most important river and is largely frequented by sport fish, although there is also annually an excellent run of chum salmon.

The supplies of springs to the river is reported as one of the heaviest on record for some years past, these being the variety which passes up in the fall, mainly during September.

The coho variety arrived in very satisfactory numbers and in this connection the unusually large size of the fish is worthy of note.

This year was no exception in the case of chums, the run being good and the variety excellent.

The showing of steelhead trout is reported as being one of the heaviest in years and the spawning beds are well seeded.

The supplies of both cutthroat and rainbow trout have been very plentiful in the river during the past season. As a matter of fact, generally speaking, the river is in a very satisfactory condition.

Sooke-Alberni

The run of cohoes and chums to the Sooke district was only fair.

The satisfactory conditions which have obtained in the Alberni district during recent years continued during 1928. The rains came in ample time to permit the several varieties of salmon to pass safely up to the spawning grounds without having to experience long delays waiting for the rivers to rise.

Undoubtedly the conservation measures taken this year in the way of prohibiting the greater part of Alberni canal to purse-seining has had the effect of permitting larger quantities of sockeye particularly to escape to the Anderson, Sproat and Stamp rivers. The number of seines operating in the Barclay sound area was this year fifty-eight as against eighty-eight during the previous season. Obviously this reduction has had its effect on conservation.

Sockeye in the Barclay sound area run only to the Anderson, Sproat and Stamp rivers. Due to conservation measures enforced for the past six years, this run has been restored and now forms a very material portion of the pack of the district. The fishway built at Stamp falls would appear to be as perfect as it is possible to make such a structure. The overseer reports that there was hardly a time between June 1 and November 1 when fish were not passing up, and as a result the spawning beds in the Great Central and Ash lake districts are well seeded. The quantity of sockeye reaching Anderson lake again this year has been most satisfactory.

The supply of cohoes in the Barclay sound area was only fair, generally speaking, although at the Stamp and Sproat rivers there was a heavy run, and these are the most important streams.

Pinks were observed for the first time at Sarita river two years ago. They have returned again this year, but the run is not large. It will be interesting to observe, however, whether it will be possible to build up a good run of this variety at this good stream, which heretofore has been frequented principally by chums.

The chum variety was again a very remarkable run and, notwithstanding the very large catch, a most satisfactory proportion was able to reach the spawning grounds. In this connection it will be remembered that at Nitinat there was at one time a tremendous run of this variety, but due to overfishing during the war years, when unusual efforts were being made to obtain food, this run became considerably depleted. As a result of conservation measures by the department in recent years, the supply is evidently increasing rapidly.

Clayoquot Sound

The sockeye run to the Kennedy lakes, Clayoquot district, was most disappointing, particularly so in view of the fact that extra precautions were taken during the fishing season to see that an adequate proportion of the run was left for the spawning grounds. When fishing operations were stopped, a very considerable body of sockeye was reported inside the limits, but only a

small portion of this supply was found on the spawning grounds, and the collection of eggs at the hatchery was short. At the Megin river the sockeye supply was found to be the heaviest in six years.

Apart from the above two waters there are no sockeye in the Clayoquot area and few pinks. Cohoes were found to be short on some of the spawning areas, but on the whole there was a fair supply.

The chum run was the largest since 1922, and all the spawning areas are abundantly supplied.

The overseer observes that the placing of the boundary signs farther out from the mouths of the streams has been an important factor in saving salmon for the spawning grounds in his district.

Nootka Sound

Springs, cohoes and chums are the only runs of any size to the Nootka district, although there are a few creek sockeye and a very few pinks in certain sections of the district. The supply of cohoes was found to be only fair on the spawning grounds. All spring salmon coming into the sound were permitted to pass up to the spawning grounds as they were not sought by the fishermen, apart from the trollers on the outside.

All rivers were heavily stocked with chums.

Kyuquot Sound

The principal varieties to the Kyuquot area are cohoes and chums. The supply of the former was quite fair but the chums arrived in very considerable quantities, the spawning grounds of this variety being well taken care of.

Quatsino

The sockeye to the Quatsino area are of the creek variety, but the quantity is very small.

The cohoes were not observed in such quantities as might be desired, but the streams were all in good condition and the fish had no difficulty in passing up to the spawning grounds.

The principal spawning area for the spring salmon is the Marble creek and its watershed. This year a very satisfactory supply passed up the river. Special conservation measures taken at the mouth of the river assisted materially.

The run of pinks has in past years been fished quite heavily and efforts are being made to restore the runs which, while never particularly heavy, were still of considerable importance in previous years.

The chums on their arrival had no difficulty in passing up to the spawning grounds without any delay whatever and arrived there in very satisfactory quantities. It is felt that this whole area is in need of better protection and during the season under review considerable areas were prohibited to fishing and it is possible that this system of protection may be further extended in the near future.

Fraser River Watershed

In the Fraser river watershed conditions found on the spawning grounds in the Stuart lake, Francois lake, Bowron lake and tributary streams show very few sockeye salmon. Of course, this condition is not a new one and probably is not worse than for a considerable number of years.

At Quesnel lake and its tributaries, such as Horsefly river and Mitchell river, indications have also been disappointing. In 1927 the local overseer

reported several thousand sockeye salmon arriving at the end of October. He stated that that was the first time such a late run had been experienced. There was no similar run in 1928.

In the Chilco area the number of sockeye observed was reported by the local officer as being the best for the last fourteen years although this is not particularly significant when one remembers the large runs which proceeded to this area previous to 1913.

This year at Raft river, which is a tributary of the North Thompson, a very encouraging quantity of spawning sockeye was observed. Unfortunately, the information obtained in previous years has not been sufficient to permit of an intelligent comparison. The local guardian estimates having seen from nine to ten thousand and while this is encouraging it would be more informative if figures from previous seasons were available.

The Shuswap area, in view of conditions during the last four years, was somewhat disappointing in 1928. The quantity of spawning sockeye observed at Adams river was almost negligible compared with the last four seasons, but conditions in the river in the way of high and discoloured water prevented the obtaining of as accurate information as was desirable. The local officer estimates having seen eight or ten thousand sockeye in Little river, but even this quantity is extremely disappointing.

Neither in Scott's creek nor in Eagle river were any encouraging indications found.

One regrettable feature is the fact that the Indians have been taking such a large percentage of spawning sockeye. When the run is large, the requirements of the Indians can be taken care of very readily, but when the run is small then each salmon is of much greater value from a reproduction standpoint and some arrangement is imperative under which the Indians will not take such large quantities of this valuable species in poor years. This also applies in the case of the Raft river run.

The Indians feel that quite apart from their normal rights to the salmon for food purposes they should not be prevented from taking what they require when such a large percentage of the runs to the Fraser river are taken by the operators in Puget sound, and that any curtailment of the Indian food requirements would only be assisting foreign fishermen.

At Cultus lake 14,889 sockeye were counted at the hatchery fence. These composed the total run, as no salmon were permitted to pass the barricade. Stripping operations produced 28,114,000 eggs.

The inspection of Harrison lake district has shown that Norris creek, which in the past has been the principal sockeye producer, was only fairly well seeded. While the local officer reports having seen approximately 2,000 sockeye spawning in the creek, this quantity, of course, is very small compared to the runs which at one time frequented the locality. At the same time, during each of the recent seasons there appears to have been an encouraging supply of spawning fish and it is probable that the runs can be increased. The quantity of sockeye in Trout creek and Hatchery creek was very satisfactory, but these streams are small. Sockeye were also observed in considerable quantities at Silver creek, one of the best tributaries to the lake.

The run of sockeye to the Pemberton district, while a good average one, was considerably less than that of 1924. Thirty-five million eggs were taken for the hatchery at Pemberton.

The run to Pitt lake and river was well maintained. The hatchery was easily filled to capacity and large quantities spawned naturally. At this point fish cultural operations, without a doubt, have been a means of materially increasing the annual run.

The streams flowing into Burrard inlet and Howe sound are not frequented by sockeye. The chum salmon arrived in unusually large quantities. The variety was particularly good and fishing operations were profitable.

Speaking generally of the Fraser river system the following conclusions would appear to be justified:—

(1) The quantities of sockeye salmon observed above Hell's Gate were not encouraging.

(2) The runs to those areas below Hell's Gate are being well maintained.

(3) The supply of cohoes and springs was not up to the average; undoubtedly this condition results in part from the operations of the trolling fleet which has been increasing in numbers during the past few seasons.

(4) The year 1928 was an off one for pinks and no run was expected.

(5) The chum run was unusually good and the quality above the average.

1907	58	.....	.....	.....	314, 074	23, 159	.....	2, 939	87, 900	118, 704 (Pks. & Ch.)	547, 459
1908	52	.....	.....	.....	355, 023	25, 433	.....	2, 731	81, 917	76, 448 (Pks. & Ch.)	542, 689
1909	72	.....	.....	.....	840, 441	18, 218	.....	799	61, 918	46, 544 (Pks. & Ch.)	967, 920
1910	58	.....	.....	.....	565, 915	19, 313	.....	9, 476	74, 382	34, 613	58, 352
1911	59	.....	.....	.....	383, 509	38, 751	.....	9, 705	119, 802	305, 247	91, 951
1912	57	.....	.....	.....	444, 762	62, 345	.....	18, 092	165, 309	247, 743	58, 355
1913	78	.....	.....	.....	972, 178	37, 433	.....	3, 616	69, 822	192, 887	77, 965
1914	63	.....	.....	.....	536, 696	32, 908	.....	16, 420	120, 201	220, 340	184, 474
1915	63	.....	.....	.....	476, 042	51, 734	.....	6, 370	146, 856	367, 352	82, 000
1916	72	.....	.....	.....	214, 789	51, 231	.....	15, 495	183, 623	280, 644	240, 201
1917	94	.....	.....	.....	339, 848	48, 630	.....	27, 646	157, 589	496, 759	475, 273
1918	88	.....	.....	.....	276, 459	65, 535	.....	41, 819 Pk. & Wh.	191, 068	527, 745	497, 615
1919	82	.....	.....	.....	369, 445	73, 179	.....	18, 295	175, 670	346, 639	372, 035
1920	65	.....	.....	.....	351, 405	95, 983	.....	13, 877	101, 972	520, 856	84, 626
1921	56	.....	.....	.....	163, 914	36, 725	.....	6, 966	117, 288	192, 906	71, 408
1922	64	.....	.....	.....	299, 614	21, 163	.....	6, 520	102, 845	581, 979	258, 204
1923	61	.....	.....	.....	334, 647	17, 539	.....	4, 745	112, 044	440, 932	418, 055
1924	62	.....	.....	.....	369, 601	18, 741	.....	6, 460	115, 944	657, 561	570, 497
1925	65	.....	.....	.....	392, 643	39, 142	.....	29, 938	188, 505	445, 400	607, 904
1926	76	.....	.....	.....	336, 995	41, 276	.....	23, 736	162, 449	772, 993	701, 962
1927	76	.....	.....	.....	308, 032	34, 029	.....	16, 129	161, 148	247, 617	562, 109
1928	62	.....	.....	.....	203, 541	11, 002	.....	5, 526	150, 684	792, 362	863, 256

NOTE.—Licenses issued 1923, 1924, 1925, 1926, 1927 and 1928 include transfers from one district to another.
 *For the years 1876 to 1901 and 1903—particulars of varieties not available—practically all sockeye.

1911.....	3	240	.....	37,327	3,434	.....	325	.....	100	7,842	11,467	5,189	65,684
1912.....	3	265	.....	36,037	5,710	.....	1,226	.....	.....	12,468	12,476	3,245	71,162
1913.....	3	265	.....	23,574	2,999	.....	152	.....	.....	3,172	20,539	2,987	53,423
1914.....	4	265	.....	31,327	2,660	.....	725	.....	.....	9,276	25,353	25,569	94,890
1915.....	4	265	.....	39,349	3,053	.....	648	.....	113	15,171	34,879	11,076	104,289
1916.....	4	265	.....	31,411	3,061	.....	784	.....	1,498	19,139	59,593	11,200	126,686
1917.....	4	265	.....	22,188	3,170	.....	1,326	.....	1,125	22,180	44,568	24,938	119,495
1918.....	6	265	.....	21,816	2,332	817	1,003	.....	1,305	17,060	59,206	40,368	143,908
1919.....	5	300	.....	23,259	2,408	585	581	.....	789	10,900	29,949	24,041	97,512
1920.....	5	342	.....	16,740	3,584	482	789	.....	560	3,700	43,151	12,145	81,153
1921.....	5	338	.....	9,364	1,431	437	220	.....	413	8,236	29,488	2,176	51,765
1922.....	5	304	.....	31,277	1,466	341	255	.....	193	3,533	75,687	11,277	124,071
1923.....	5	244	.....	17,821	2,522	457	335	.....	595	7,894	44,165	25,791	99,580
1924.....	4	210	.....	33,590	2,142	327	375	.....	1,035	6,362	72,436	26,612	142,939
*1925.....	3	210	.....	20,351	5,441	387	538	.....	470	8,188	35,880	23,497	94,752
†1925.....	.....	.....	.....	18,945	4,067	387	392	.....	457	7,726	34,530	22,504	89,008
*1926.....	4	316	.....	15,929	4,616	751	597	.....	375	4,274	43,891	15,392	85,825
†1926.....	.....	.....	.....	15,929	4,616	751	597	.....	375	4,274	50,815	15,392	92,749
*1927.....	4	302	.....	11,986	3,221	511	213	.....	96	3,845	16,609	3,307	39,788
†1927.....	.....	.....	.....	11,986	3,221	511	213	.....	96	3,845	16,609	3,307	39,788
*1928.....	3	263	.....	5,558	1,471	68	615	.....	36	18,002	95,998	4,591	126,339
†1928.....	.....	.....	.....	5,540	1,471	68	307	.....	36	10,734	83,183	3,538	104,877

NORVE.—Licenses issued 1926, 1927 and 1928 include transfers from other districts.

*Pack of fish caught at Naas River regardless where canned. †Pack at Naas River regardless where caught.

For the years 1881 to 1884, 1888 to 1901 and 1903, particulars of varieties not available—practically all sockeye.

1907.	13	108,413	10,378	.....	.....	.....	15,247	25,217 (P.k. & Ch.)	*159,255
1908.	13	139,846	13,374	.....	468	.....	10,075	45,404 (P.k. & Ch.)	209,177
1909.	12	87,901	11,727	.....	742	.....	12,240	28,120 (P.k. & Ch.)	140,739
1910.	12	97,246	9,546	.....	239	.....	11,531	13,473	222,035
1911.	12	131,066	15,514	.....	2,428	.....	23,376	81,956	254,410
1912.	12	92,498	19,332	.....	4,501	.....	39,835	97,588	254,258
1913.	13	52,927	23,250	.....	3,186	.....	18,647	66,045	164,055
1914.	13	130,166	11,529	.....	211	.....	16,378	71,021	237,634
1915.	13	116,553	15,069	.....	204	.....	32,190	107,578	279,161
1916.	14	60,923	18,372	.....	2,561	.....	47,409	73,029	223,158
1917.	15	65,760	13,586	.....	2,699	.....	38,456	148,319	292,219
1918.	15	123,322	16,013	.....	6,828	.....	38,759	161,727	374,216
1919.	14	184,945	19,661	.....	2,656	.....	36,559	117,303	398,877
1920.	15	90,869	37,403	.....	3,123	.....	18,068	177,679	334,392
1921.	13	40,018	18,599	.....	445	.....	45,033	124,457	234,765
1922.	13	100,615	7,080	.....	1,805	.....	24,673	203,555	362,055
1923.	13	131,731	8,863	.....	2,885	.....	31,967	145,973	338,863
1924.	13	144,732	9,511	.....	1,301	.....	26,907	181,338	390,967
†1925.	13	77,785	17,811	.....	2,457	.....	38,029	127,226	76,352
†1925.	13	81,149	19,185	.....	2,603	.....	39,168	130,083	348,866
†1926.	15	82,307	17,896	.....	1,750	.....	30,153	170,586	350,804
†1926.	15	82,357	17,896	.....	1,750	.....	30,209	210,064	407,533
†1927.	13	83,988	13,595	.....	1,609	.....	25,209	38,903	177,173
†1927.	13	83,984	14,856	.....	1,609	.....	25,623	38,761	187,639
†1928.	11	34,524	4,121	.....	337	.....	18,751	191,812	262,616
†1928.	11	34,559	5,043	.....	354	.....	30,194	209,579	298,709

*Approximately.

†Pack of fish caught at Skeena River regardless where canned.

‡Pack at Skeena River regardless where caught.

Note.—Licenses issued 1923, 1924, 1925, 1926, 1927 and 1928 include transfers from other districts.

For the years 1877 to 1903. Particulars of varieties not available—practically all sockeye.

1913.....	8	79,345	1,589	.....	.....	.....	3,708	4,287	2,015	.....	90,944
1914.....	*7	89,890	566	.....	.....	.....	7,789	5,784	5,023	.....	109,052
1915.....	8	162,651	1,022	.....	.....	.....	7,115	2,964	5,387	292	179,431
1916.....	9	58,192	1,033	.....	389	.....	15,314	3,567	20,144	13,990	112,629
1917.....	10	75,326	715	.....	102	.....	9,124	8,065	16,101	4,325	113,758
1918.....	10	68,447	957	85	367	.....	12,074	29,542	6,729	10,736	128,937
1918.....	10	66,812	957	85	367	.....	12,074	29,542	6,729	10,736	128,937
1919.....	11	73,754	967	234	241	.....	9,038	6,538	7,089	13,053	110,736
1919.....	11	72,072	967	234	241	.....	9,038	6,538	7,089	13,053	109,234
1920.....	10	142,793	1,537	81	190	.....	2,922	26,189	1,226	.....	174,938
1920.....	10	133,245	1,537	81	190	.....	2,922	26,189	1,226	.....	168,390
1921.....	10	50,849	386	.....	44	.....	4,055	3,055	173	.....	58,562
1921.....	10	49,729	406	.....	44	.....	4,784	5,336	173	.....	60,569
1922.....	10	68,818	216	69	38	82	1,145	24,311	311	.....	94,990
1922.....	10	66,518	216	69	38	82	1,145	24,311	311	.....	92,690
1923.....	10	118,502	230	256	113	.....	1,526	10,057	3,246	.....	133,930
1923.....	10	112,350	230	256	113	.....	1,526	10,057	3,246	.....	127,778
1924.....	10	91,764	215	261	149	.....	1,886	15,103	4,908	.....	114,318
1925.....	11	301,186	344	311	116	.....	4,887	7,675	11,501	.....	226,030
1925.....	11	170,581	215	311	57	.....	4,886	8,625	11,477	.....	196,132
1926.....	12	89,866	535	249	160	.....	10,348	8,483	11,690	.....	124,341
1926.....	12	74,629	473	189	142	.....	7,448	13,503	11,751	.....	108,146
1927.....	13	101,053	463	530	321	.....	5,475	1,383	5,027	.....	114,271
1927.....	13	87,145	322	530	291	.....	4,980	1,402	3,617	.....	98,334
1928.....	11	93,361	458	443	157	.....	9,761	3,130	9,200	.....	116,523
1928.....	11	88,875	156	443	157	.....	1,098	16,703	3,626	.....	111,066

NOTE.—Figures shown in black are packs from fish caught at Rivers Inlet or Smiths Inlet. Figures in black for years previous to 1918 are actual packs. Figures shown in italics, 1918 to 1928 are actual packs irrespective of where fish taken and not including fish shipped out for canning in other districts.

*1914 figures include Rivers Inlet pack only, no figures being available for Smiths Inlet for that year.

NOTE.—Re column "Varieties other than sockeye packed at Smiths Inlet." For the years this column is utilized, figures of the different varieties other than sockeye packed at Smiths Inlet were not available, and had to be shown as a total. Sockeye for these years are shown under their proper heading.

NOTE.—Licenses issued 1923, 1924, 1925, 1926, 1927 and 1928 include transfers from other districts.

*For the years 1882 to 1884 and 1886 to 1901 and 1903—particulars of varieties not available—practically all sockeye.

1907	18	1,726	.....	.....	.....	59,815	3,448	.....	557	.....	35,706	63,530 (Pk. & Ch.)	163,116
1908	16	1,374	.....	.....	.....	63,126	1,427	.....	18	.....	24,198	415 (Pk. & Ch.)	89,184
1909	38	2,688	.....	.....	.....	542,248	1,428	.....	.....	.....	21,540	1,987 (Pk. & Ch.)	567,203
1910	21	1,577	.....	.....	.....	133,045	1,018	.....	8,925	.....	27,855	52,177	223,148
1911	15	1,396	.....	.....	.....	58,487	7,028	.....	6,751	.....	39,740	47,237	301,344
1912	15	1,430	.....	2	.....	108,784	14,655	.....	8,373	.....	38,574	12,961	173,921
1913	35	2,560	.....	2	.....	684,596	3,573	.....	49	.....	11,648	9,973	732,059
1914	20	2,656	.....	.....	.....	185,483	9,485	.....	14,000	.....	38,639	6,057	328,390
1915	22	2,616	.....	.....	.....	89,040	15,388	.....	3,532	.....	34,114	128,555	289,119
1916	21	2,240	.....	.....	.....	27,394	11,096	.....	9,217	3,096	24,580	840	106,440
1917	29	2,626	.....	.....	.....	123,614	10,197	.....	18,916	4,944	25,895	134,442	377,988
1918	18	1,582	.....	.....	.....	16,849	15,192	.....	24,274	3,760	40,111	18,388	206,003
1919	14	1,337	.....	1	.....	29,628	14,519	579	3,592	15,613	39,253	—	158,718
1920	11	1,288	.....	1	.....	44,598	19,961	704	2,204	4,488	22,934	12,839	132,860
1921	13	1,437	.....	.....	.....	35,900	11,360	2,188	5,480	1,323	29,978	8,178	103,917
1922	10	1,296	.....	.....	.....	48,744	10,561	467	3,867	812	23,587	29,578	137,482
1923	11	964	.....	.....	.....	29,423	3,854	2,433	3,615	.....	20,173	63,645	103,248
1924	9	969	.....	.....	.....	36,200	2,982	664	4,056	.....	21,935	31,968	224,637
1925	10	969	.....	.....	.....	31,523	7,335	592	25,482	1,757	36,717	99,800	209,050
1926	10	1,063	.....	.....	.....	83,589	11,774	873	20,130	5,107	21,787	32,256	272,993
1927	10	1,249	.....	.....	.....	57,085	6,553	1,030	10,493	14,036	24,079	102,535	273,134
1928	8	1,303	.....	.....	.....	26,530	1,173	1,351	3,661	10,621	27,061	2,881	280,013
			.....	.....	.....			248		795			255,455

NOTE.—Licenses issued 1923, 1924, 1925, 1926, 1927 and 1928 include transfers from other districts.
 *For the years 1876 to 1901, particulars of varieties not available—practically all sockeye.

STATEMENT No. 6

PACK OF CANNED SALMON OF PUGET SOUND FROM 1887 TO 1927

Year	Number of canneries operated	Spring	Sockeye	Cohoe	Chum	Pink	Steel- head	Total
1887.....		Partic	ulars of vari	eties not a	vailable.			22,000
1888.....	4							21,975
1889.....	2	240		7,480	1,145	2,890		11,674
1890.....	1	1,000		3,000	4,000			8,000
1891.....	2	382	5,538	5,869	3,093	5,647		20,529
1892.....	2	86	2,954	7,206	16,180			26,426
1893.....	3	1,200	47,852	11,812	11,380	17,530		89,331
1894.....	3		41,781	22,418	22,152	9,049		95,400
1895.....	7	1,542	65,143	50,865	38,785	23,633		179,968
1896.....	11	13,495	72,979	82,640	26,550			195,664
1897.....	12	9,500	312,048	91,900	23,310	57,268		494,026
1898.....	18	11,200	252,000	98,600	38,400			400,200
1899.....	19	24,364	499,646	101,387	12,001	252,733		919,611
1900.....	19	22,350	229,800	128,200	89,100			469,450
1901.....		Partic	ulars of vari	eties not a	vailable.			1,380,590
1902.....	21	30,049	372,301	85,817	93,492			581,659
1903.....	22	14,500	167,211	103,450	12,001	181,236		478,488
1904.....	13	14,441	109,264	118,127	49,656			291,488
1905.....	24	1,804	825,453	79,335	41,057	70,992		1,018,641
1906.....	16	8,139	178,748	94,497	149,218			430,602
1907.....	14	1,814	93,122	119,372	50,249	433,423		698,080
1908.....	22	95,210	170,951	128,922	47,607	6,075		448,765
1909.....	11	13,019	1,097,904	143,133	53,688	370,993		1,632,949
1910.....	24	10,064	248,014	162,755	146,942	108		567,883
1911.....	15	21,823	127,761	256,124	104,321	1,046,992		1,557,029
1912.....	20	20,252	184,680	149,727	60,760	700		416,125
1913.....	22	1,234	1,673,099	61,019	56,225	791,886		2,583,463
1914.....	31	26,044	335,230	151,893	278,801	892		792,860
1915.....	41	28,466	64,548	180,783	411,724	583,649		1,269,206
1916.....	32	37,030	84,637	155,832	427,878	1,887		707,278
1917.....	45	57,543	411,538	114,276	216,285	1,124,884		1,921,554
1918.....	32	63,366	50,723	235,860	267,538	6,605	106	624,198
1919.....	35	68,542	64,346	210,883	525,541	421,215	5,076	1,295,626
1920.....	11	25,846	62,654	24,502	48,849	4,669		166,520
1921.....	23	25,567	102,967	89,412	30,831	404,713		653,490
1922.....	16	20,615	48,566	111,711	65,552	2,225		248,729
1923.....	18	15,777	47,402	122,000	97,081	475,849	29	758,138
1924.....	12	19,968	69,369	87,879	134,360	5,945	128	317,649
1925.....	23	28,268	106,064	171,587	41,635	555,848	141	903,543
1926.....	14	27,763	44,569	120,846	112,411	2,125	63	307,778
1927.....	21	43,443	96,343	133,528	37,414	585,506	216	896,450
1928.....	12	24,628	61,044	92,770	145,735	5,816	265	330,258

STATEMENT No. 7

STATEMENT OF HALIBUT LANDINGS—BRITISH COLUMBIA
1913 TO 1928

	cwt.		cwt.
1913.....	223,465	1921.....	325,868
1914.....	214,444	1922.....	293,184
1915.....	194,896	1923.....	334,667
1916.....	123,062	1924.....	331,382
1917.....	113,529	1925.....	318,240
1918.....	186,229	1926.....	315,095
1919.....	210,777	1927.....	271,354
1920.....	238,770	1928.....	302,820

STATEMENT No. 8

STATEMENT OF DRY SALT HERRING PACKS, 1918-1928—BRITISH COLUMBIA

Year	District No. 1	District No. 2	District No. 3		Total
			East Coast	West Coast	
	cwt.	cwt.	cwt.	cwt.	cwt.
1918.....	20,000		109,900	42,710	172,610
1919.....	4,000		43,000	208,058	255,058
1920.....	807	1	176,640	334,720	512,168
1921.....	249		231,240	248,482	479,971
1922.....			297,871	224,897	522,768
1923.....		8,935	250,420	484,681	744,036
1924.....			305,266	548,277	853,543
1925.....		4,120	591,162	487,892	1,083,174
1926.....	11,134	4,192	596,114	327,207	938,647
1927.....	24,380	7,600	542,385	473,825	1,048,190
1928.....	46,995		748,032	277,161	1,072,188

STATEMENT No. 9

CANNED PILCHARD PACK—BRITISH COLUMBIA
1917 TO 1928

	Cases		Cases
1917.....	1,090	1923.....	17,195
1918.....	63,693	1924.....	14,898
1919.....	63,065	1925.....	37,182
1920.....	91,929	1926.....	26,731
1921.....	16,091	1927.....	58,501
1922.....	19,186	1928.....	65,097

STATEMENT No. 10

PRODUCTION FISH OIL AND MEAL—BRITISH COLUMBIA, 1920-1928

Year	From Pilchards		From Herring		From Whales			From Other Sources	
	Meal and Fer- tilizer	Oil	Meal	Oil	Whale- bone and Meal	Fer- tilizer	Oil	Meal and fertilizer	Oil
	tons	gals.	tons	gals.	tons	tons	gals.	tons	gals.
1920.....					503	1,035	604,070	466	55,669
1921.....								489	44,700
1922.....					326	230	283,314	911	75,461
1923.....					485	910	706,514	823	180,318
1924.....					292	926	645,657	1,709	241,376
1925.....	2,083	495,653			347	835	556,939	2,468	354,853
1926.....	8,481	1,898,721	310	13,700	340	666	468,206	1,752	217,150
1927.....	12,169	2,673,876	1,838	170,450	345	651	437,967	2,512	375,130
1928.....	14,500	3,995,806	831	68,411	376	754	571,914	3,658	411,207

STATEMENT No. 11

WHALE CATCH LANDINGS, BRITISH COLUMBIA, 1918 TO 1928

Species	1918	1919	1920	†1921	1922	1923	1924	1925	1926	1927	1928
Sperm.....	38	94	83	76	80	82	83
Sulphur.....	4	62	56	29	14	10	47
Fin.....	94	166	125	135	124	138	140
Hump.....	50	78	47	40	25	21	21
Sel.....	1	53	100	68	25	7	13
Right.....	2	.....	1	.....	.....
Bottlenose.....	2	1	3	.....	.....	1
Gray.....
Totals.....	*500	*432	*493	.....	187	455	414	351	269	258	305

* All varieties † No whaling plants operated 1921

STATEMENT No. 12

STATEMENT OF FUR SEAL SKINS TAKEN AND LANDED, BRITISH COLUMBIA, 1912-1928

Year	District No. 1	District No. 2	District No. 3	Total
1912.....	205	205
1913.....	285	119	404
1914.....	95	257	352
1915.....	39	400	439
1916.....	21	138	159
1917.....	14	204	218
1918.....	78	10	88
1919.....	53	17	70
1920.....	502	556	1,058
1921.....	270	2,079	2,349
1922.....	291	639	930
1923.....	678	3,746	4,424
1924.....	370	1,862	2,232
1925.....	810	3,655	4,465
1926.....	655	2,169	2,824
1927.....	188	1,288	1,476
1928.....	465	1,625	2,090

STATEMENT No. 13

DESTRUCTION OF SEA LIONS

—	1922	1923	1924	1925	1926	1927	1928	Total
Virgin Rocks—	.....	.....	.....	.....	.....	.....	.....	.....
Pups.....	.....	649	903	1,067	565	635	375	4,194
Adults.....	.....	1,111	1,333	1,520	877	858	632	6,331
Pearl Rocks—	.....	.....	.....	.....	.....	.....	.....	.....
Pups.....	.....	5	312	102	146	40	2	607
Adults.....	220	120	158	138	368	130	30	1,164
Solander Rock—	.....	.....	.....	.....	.....	.....	.....	.....
Adults.....	.....	.....	.....	.....	.....	.....	103	103
Totals.....	220	1,885	2,706	2,827	1,956	1,663	1,142	12,399

STATEMENT OF FISHERY LICENSES ISSUED, BRITISH COLUMBIA, SEASON 1928—WHOLE PROVINCE

FISHERIES BRANCH

Variety of License	Issued				Transfers				Operating				Remarks
	Whites	Indians	Japs	Total	Whites	Indians	Japs	Total	Whites	Indians	Japs	Total	
Salmon cannery.....	76	.....	.....	76	.....	.....	.....	.....	76	.....	.....	76	
Salmon curing.....	29	.....	4	33	.....	.....	.....	.....	29	.....	4	33	
Salmon trap-net.....	7	.....	.....	7	.....	.....	.....	.....	7	.....	.....	7	
Salmon drag-seine.....	20	2	.....	22	.....	.....	.....	.....	20	.....	.....	20	
Salmon purse-seine.....	307	46	.....	353	44	.....	.....	44	351	46	.....	397	
Salmon gill-net.....	2,505	1,020	938	4,463	692	24	.....	716	3,197	1,044	938	5,179	(1 cancelled)
Salmon trolling.....	2,144	644	155	2,943	44	.....	.....	44	2,188	644	155	2,987	(4 cancelled)
Boat.....	136	10	87	233	.....	.....	.....	.....	136	10	87	233	
Buyers.....	59	15	.....	74	.....	.....	.....	.....	59	15	.....	74	
Assistant salmon gill-net.....	218	301	478	997	11	2	.....	13	229	303	478	1,010	
Capt. salmon seine.....	110	168	.....	278	1	.....	.....	1	111	168	.....	279	
Asst. salmon seine.....	796	930	.....	1,726	3	.....	.....	3	799	930	.....	1,729	(5 cancelled)
Herring curing.....	25	.....	5	30	.....	.....	.....	.....	25	.....	5	30	(4 cancelled)
Herring purse-seine.....	108	3	.....	111	3	.....	.....	3	111	.....	.....	114	
Herring drag-seine.....	2	.....	.....	2	.....	.....	.....	.....	2	.....	.....	2	
Herring gill-net.....	34	.....	4	38	.....	.....	.....	.....	34	.....	4	38	
Capt. herring seine.....	71	21	6	98	.....	.....	.....	.....	71	21	6	98	
Asst. herring seine.....	607	124	165	896	.....	.....	.....	.....	607	124	165	896	
Crab.....	134	5	1	140	1	.....	.....	1	135	5	1	141	
Cod gill-net.....	24	.....	26	50	.....	.....	.....	.....	24	.....	26	50	
Cod hook and line.....	240	28	393	661	.....	.....	.....	.....	240	28	393	661	
Grayfish gill-net.....	53	3	74	130	.....	.....	.....	.....	53	3	74	130	
Grayfish hook and line.....	164	8	117	289	1	.....	.....	1	165	8	117	290	
Grayfish purse-seine.....	1	.....	.....	1	.....	.....	.....	.....	1	.....	.....	1	
Smelt.....	60	1	14	75	.....	.....	.....	.....	60	1	14	75	
Abalone.....	1	.....	.....	1	.....	.....	.....	.....	1	.....	.....	1	
Miscellaneous fishery.....	122	10	44	176	1	.....	.....	1	123	10	44	177	
Miscellaneous canery.....	5	.....	.....	5	.....	.....	.....	.....	5	.....	.....	5	
Reduction works.....	26	.....	.....	26	.....	.....	.....	.....	26	.....	.....	26	
Totals.....	8,084	3,321	2,261	13,666	801	26	.....	827	8,885	3,347	2,261	14,493	(14 cancelled)

Indian permits..... 924
 Angling permits..... 244

STATEMENT No. 15

STATEMENT OF SALMON LICENSES ISSUED. BRITISH COLUMBIA, 1919-1928

Kind of License	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
<i>District No. 1—</i>										
Salmon cannery.....	14	11	13	10	11	9	10	10	10	10
Salmon gill-net.....	1,337	1,288	1,437	1,296	964	969	969	1,063	1,249	1,303
<i>District No. 2—</i>										
Salmon cannery.....	45	41	32	41	37	38	41	50	48	47
Salmon purse-seine.....	35	79	13	73	126	107	137	193	244	158
Salmon drag-seine.....	81	38	30	30	20	19	15	14	16	9
Salmon gill-net:—										
Naas River.....	300	342	338	304	244	210	210	316	302	263
Skeena River.....	1,153	1,153	1,109	1,091	900	941	1,068	1,129	1,198	1,208
Rivers Inlet.....		871	1,000	1,012	987	770	891	1,115	1,273	1,117
Smiths Inlet.....	916	173	215	179	197	193	236	368	570	424
Bella Coola.....		193	241	165	134	146	139	192	195	173
Kimsquit.....				120	122	96	137	100	104	80
Butedale.....		61	5		63	32	60	37	108	58
Namu.....	421	136	138	136	215	87	109	139	180	77
Queen Charlotte Islands.....		14	1	4	1	1	17	27	42	22
Total, District No. 2.....	2,490	2,943	3,047	3,011	2,863	2,476	2,867	3,423	3,972	3,422
<i>District No. 3—</i>										
Salmon cannery.....	23	13	11	14	13	15	16	19	18	19
Salmon purse-seine.....	103	76	46	74	97	135	192	252	308	239
Salmon drag-seine.....	23	7	5	10	11	13	22	27	30	13
Salmon gill-net.....	771	530	293	176	142	251	390	364	422	454
<i>Whole Province—</i>										
Salmon cannery.....	82	65	56	65	61	62	67	79	76	76
Salmon purse-seine.....	138	155	59	147	223	242	329	445	552	397
Salmon drag-seine.....	104	45	35	40	31	32	37	41	46	22
Salmon gill-net.....	4,598	4,761	4,777	4,483	3,969	3,696	4,226	4,850	5,643	5,179

NOTE.—During the season 1928 F. Millerd's cannery at Vancouver, the Cassiar Cannery on the Skeena and the Massett Cannery, Massett Inlet, operated without licenses, and are not included in the number of cannery licenses shown above.

STATEMENT No. 16

STATEMENT OF POWER BOATS OPERATED IN DISTRICT No. 2, BRITISH COLUMBIA, IN CONNECTION WITH SALMON GILLNET OPERATIONS

	1924	1925	1926	1927	1928
Naas river.....	3	9	35	21	37
Skeena river.....	18	64	133	162	216
Bella Coola and Kimsquit.....	1	12	49	47	90
Central area.....		8	28	87	13
Rivers inlet.....	54	110	254	248	479
Smiths inlet.....	9	39	131	110	204
Queen Charlotte islands.....					10
	85	242	630	675	1,049

APPENDIX No. 2

REPORT ON THE WORK OF THE BIOLOGICAL BOARD FOR 1928-29

By J. J. COWIE, *Hon. Secretary-Treasurer*

The board is a semi-independent body whose members receive no remuneration. To it has been assigned the conduct and control of investigations of scientific, practical and economic problems connected with the fisheries. It operates four stations for research work. Two of these are on the Atlantic coast: a Biological Station at St. Andrews, N.B., and an Experimental Station at Halifax, N.S. There are two on the Pacific coast: a Biological Station at Nanaimo, B.C., and an Experimental Station at Prince Rupert, B.C. There is a field station at Cultus Lake, B.C., for the study of sockeye salmon, while a laboratory is used at the University of Manitoba for the study of fish in the Prairie Provinces. The following is an outline of the work carried on at the various stations during the year under review:—

BIOLOGICAL STATION, ST. ANDREWS, N.B.

INVESTIGATORS

The scientific staff employed during 1928 consisted of the following:—

Director: Dr. A. G. Huntsman.
 Hydrographer: Mr. H. B. Hachey.
 Investigator for trout: Mr. H. C. White.
 Investigator for fry planting: Mr. W. S. Hall.
 Investigator for lobster (summer season only): Mr. A. F. Chaisson.
 Investigator for shad (summer season): Mr. A. A. Giffin.
 Assistant with reports (summer season): Dr. H. I. Battle.
 Assistant with fisheries technology (summer season): Mr. E. E. Daggett.

The volunteer investigators engaged in work at the station or along the coast during the year were as follows, the periods of time spent being indicated:—

Mr. W. S. Allen, Dalhousie University, July 6 to August 19.
 Miss Armine Alley, University of Toronto, June 15 to August 31.
 Prof. P. M. Bayne, Acadia University, June 4 to August 14.
 Mr. S. A. Beatty, McGill University, May 30 to September 5.
 Miss Ruby Bere, University of Manitoba, June 4 to August 30.
 Mr. N. J. Berrill, Leeds University, England, July 23 to September 16.
 Prof. C. J. Connolly, University of St. Francis Xavier's College, June 30 to August 15.
 Miss V. M. Davidson, High School of Commerce, Toronto, August 8 to 31.
 Miss Dorothy Dow, University of Toronto, June 8 to September 7.
 Miss Marjory Ellis, Dalhousie University, July 3 to August 31.
 Miss Elizabeth Frame, Dalhousie University, July 3 to September 7.
 Miss Nancy Frost, Acadia University, June 4 to July 16.
 Mr. N. E. Gibbons, Queen's University, June 12 to September 13.
 Prof. J. N. Gowanloch, Dalhousie University, July 5 to September 22.
 Mrs. J. N. Gowanloch, Dalhousie University, July 24 to September 22.
 Miss M. E. Huntsman, University of Toronto, June 4 to September 22.
 Mr. R. B. Kerr, University of Toronto, June 5 to September 5.
 Prof. A. B. Klugh, Queen's University, June 4 to September 15.
 Prof. F. E. Lloyd, McGill University, August 6 to August 19.
 Miss M. E. MacKay, Dalhousie University, June 4 to August 6.
 Prof. Douglas McIntosh, Dalhousie University, July 20 to August 3.
 Mr. A. W. H. Needler, University of Toronto, May 5 to September 20, 1928; December 1 to December 28, 1928; February 15 to April 15, 1929.

Miss E. C. Odell, Macdonald College, July 5 to September 22.
Prof. G. B. Reed, Queen's University, June 13 to June 20.
Prof. A. D. Robertson, University of Western Ontario, July 3 to August 31.
Mr. W. R. Sawyer, McGill University, July 15 to September 15.
Miss E. B. Shaw, University of Toronto, July 1 to September 7.
Mr. A. E. Warren, Milton Academy, Milton, Mass., July 2 to August 29.
Miss N. E. Wright, University of Western Ontario, June 19 to August 31.

INVESTIGATIONS AT THE STATION

More than thirty-five separate investigations were carried through at the station during the year, dealing with haddock, cod, herring, hake, flounder, salmon, trout, crabs, squid, scallops, mussels, and various other marine animals and plants. Some of the more outstanding of these may be summarized as follows:—

The nature of fish muscle and of the changes which it undergoes before and after death has been the subject of many studies, and is of fundamental importance for the proper utilization of fish as food. Haddock has served as the principal kind of fish for these studies. In the struggles of capture, the muscles of fish lose glycogen, and there is an increase in the sugar of the blood which may lead to death of the fish while still in the water. Haddock taken on the line trawl recover from this condition, when kept quiet in the sea, there being a marked change after six to seven days, though none in the first three days (MacKay). On death the muscle changes so rapidly that it is impossible with present methods to isolate any of the proteins before they change in character, and the nature of these changes is still unknown. The proteins of the cod, haddock and hake are strikingly similar, but those of the skate are different. Fairly conclusive proof has been given that the ammonia produced during autolytic decomposition is derived in large part, if not altogether from the amide groups of the proteins (Beatty). During rigor or death stiffening the juice of the muscle increases in protein content and this seems to have a relation to the amount of water associated with the proteins (Shaw). The heating of haddock muscle, as occurs in cooking, produces a more or less rapid increase in strength or firmness, which is followed by a slower decrease, the former being probably due to heat coagulation, and the latter to hydrolysis of collagen in the connective tissue (Dow).

Haddock muscle can sometimes be obtained in a sterile condition, that is free from bacteria, and on comparing this with muscle that contains bacteria, it is found that the decomposition is different. Muscle infected with bacteria decomposes much more rapidly and produces a considerable amount of ammonia, whereas in the sterile muscle there is only a very slight increase in the very small amount of ammonia present at the beginning (Gibbons).

Mussels are eaten by starfishes, sea urchins, certain whelks and flounders. In Passamaquoddy bay these enemies seem to prevent the development of mussel beds at or below low tide mark, but if placed below low tide level in cages to afford protection from the numerous enemies that surround them there, they grow more rapidly than when living in the beds between tide marks, where they occur in great abundance (Warren).

The shore flounder of Passamaquoddy bay (*Pseudopleuronectes*) grows at a rate, which decreases only gradually up to an age of eight years at least, when a length of approximately fourteen inches is attained. This fish spawns in the spring and the fry transform and seek the bottom about the end of June. They go inshore on the mud flats, and with spring tides many are left exposed in tidal pools to the heating effect of the sun, and so may have to endure temperatures as high as 87° F. or somewhat more. The common shrimp (*Crango*) and certain sculpins were found dying under these conditions, but the young flounders were apparently able to survive. Laboratory experiments show that under comparable conditions, namely, a rise in temperature of about 2° F. every five

minutes, the very young were found to withstand a temperature even as high as 88° F. before collapsing, which the older fish cannot do (Huntsman).

At the head of the bay of Fundy with large areas of the bottom exposed to the weather by the great drop in the tide, the number of kinds of plants and animals is considerably less and the individuals of the various kinds smaller and fewer than in the Passamaquoddy region at the mouth of the bay of Fundy, and there seems to be a greater mortality (Bayne).

The very great vertical mixing that takes place steadily at the mouths of Passamaquoddy bay apparently makes possible the growth of diatoms and other plants in great luxuriance throughout a very long season. A study of the monthly abundance of diatoms in the region for four recent years, beginning with 1925, reveals the fact that their numbers increase and decrease, neither with rise and fall in temperature, nor with rainfall and drought, but with the amount of sunshine, so that these minute plants so important for the food of small animals and ultimately of fishes, are in greatest quantity about the end of June when the sun is highest in the heavens, and least abundant toward the end of December, when the sun is least in evidence (Davidson).

Calanus finmarchicus, a minute shrimp or water flea, which is the chief constituent of what is known to the fishermen as the "red feed" of the herring, does not breed to any extent in the bay of Fundy, but appears to enter that bay from the gulf of Maine in the young state (Wright).

Regular observations are made throughout the year of local conditions, with daily records of the temperature of water and air, and weekly or monthly collections of plankton and hydrographic material at established stations in the bay of Fundy, Passamaquoddy bay, and the St. Croix river, and in the fresh water of Chamcook lake.

FIELD INVESTIGATIONS

The *Edward E. Prince* carried through extensive mackerel tagging operations at Yarmouth during the early part of the season. A survey was made during the summer of the conditions in the bay of Fundy and in the neighbouring part of the gulf of Maine to determine the distribution of the cold salt surface water and its possible relation to the most productive fisheries. During the later summer the distribution of the herring fry from the spawning grounds at the mouth of the bay of Fundy was investigated and the location of the "red feed" of the herring determined.

Mr. A. W. H. Needler continued his study of the haddock during various seasons of the year, and principally on various parts of the coast of Nova Scotia. Large numbers of haddock were tagged in the vicinity of Ingonish, C.B., during May and in this work Mr. G. C. Whitely, Jr., of Dalhousie University, assisted.

Mr. A. F. Chaisson carried through a statistical study of the size of the lobster, comparing the conditions along the coast of western Nova Scotia with those in Northumberland strait, in which between five and six thousand individuals were examined. A survey was made with the help of the *Edward E. Prince* of the conditions in Tusket bay and it demonstrated the presence of large areas with water well above 55° F. in temperature and hence suitable for the breeding of lobsters.

Prof. A. D. Robertson continued his study of the growth of the oyster under a variety of natural conditions as they exist in Hillsborough river, Prince Edward Island.

Mr. B. W. Taylor of McGill University accompanied the expedition of the Department of Marine and Fisheries to Hudson strait aboard the *Montcalm* as biologist in connection with the fisheries. Drift bottles for a study of the currents were dropped en route, and the physical and biological conditions in Hudson strait were investigated.

FISHERIES TECHNOLOGY

A survey was made by Mr. Daggett of the methods used in the handling of fish in Charlotte county under the following heads: canning of clams, smoking of fish, fresh and dried fish.

Equipment was installed for the preparation of Ice Fillets and certain improvements were made in the process. A considerable amount was frozen and packed for shipment to Toronto for the experimental sale there, which began in January, 1929. These were at first entirely from haddock, but later from cod, hake and flounder.

Mr. W. W. Stewart of the staff of the Fisheries Experimental Station at Halifax was accommodated for an investigation of the preparation of fish meal from the waste from sardine (herring) canneries.

IMPROVEMENTS

A garage has been built for the accommodation of automobiles used in connection with the station. The road leading to the station has been in part widened and improved. Construction has been started on a double cottage with housekeeping facilities for housing workers with families, who have been debarred hitherto through lack of accommodation. Three new experimental ponds of brick and cement have been constructed. A cold room with insulated wall and an ice jacket has been constructed in the laboratory basement for extensive experiments at low temperature. Additional tanks for holding the fish required for the laboratory experiments have been built. A thermograph for the continuous recording of the water temperature has been installed on the *Edward E. Prince*.

PUBLICATIONS

The following articles on work done in connection with the station have appeared during the year:—

- Berrill, N. J.—The identification and validity of certain species of Ascidians. *Jour. Mar. Biol. Ass'n.* Vol. XV, No. 1.
- Benson, C. C.—Hydrogen ion concentration of fish muscle. *Jour. Biol. Chem.* Vol. LXXVIII, No. 3, 1928.
- MacKay, M. E.—The digestive system of the eel-pout (*Zoarces anguillaris*). *Biol. Bull.* Vol. LVI, No. 1.
- MacKay, M. E.—Note on the bile in different fishes. *Biol. Bull.* Vol. LVI, No. 1.
- Koch, L. W.—Notes on Canadian Rotifera. *Contr. Can. Biol. & Fish.* N.S.; Vol. IV, No. 5.
- Wilton, Mgt. H. and Wilton, Helen. I.—Conditions affecting the growth of the soft-shell clam, *Mya arenaria* L. *Contr. Can. Biol. & Fish.* N.S., Vol. IV, No. 6.
- Rice, Christine E.—The decomposition of clam muscle in acid solutions. *Contr. Can. Biol. & Fish.*, N.S. Vol. IV, No. 7.
- Rankin, G. P.—The nutritional physiology of Cladocera. *Contr. Can. Biol. & Fish.*, N.S., Vol. IV, No. 8.
- Burwash, F. M.—The iodine content of the thyroid of two species of Elasmobranchs and one species of Teleost. *Contr. Can. Biol. and Fish.*, N.S., Vol. IV, No. 9.
- Coulthard, H. S.—Growth of the sea mussel. *Contr. Can. Biol. & Fish.*, N.S. Vol. IV, No. 10.
- Scott, W. C. M.—A note on the effect of temperature and salinity on the hatching of the eggs of the winter flounder (*Pseudopleuronectes americanus* Walbaum). *Contr. Can. Biol. & Fish.* Vol. IV, No. 11.
- Berrill, N. J.—The validity of *Lophius americanus*, Val. as a species distinct from *L. piscatorius* Linn., with notes on the rate of development. *Contr. Can. Biol. & Fish.* N.S. Vol. IV, No. 12.

REPORTS

The following reports on the investigations have been submitted during the year:—

Alley, Armine—

- (1) Death rate of crabs' eggs at various temperatures (*Cancer amoenas*).
- (2) Hoop trap record showing the variations of sea urchins, whelk (*B. undatum*) and starfish (*A. forbesi* *A. vulgaris*).
- (3) Comparison of the growth of mussels (*Mytilus edulis*) at depths 4, 8 and 12 metres.
- (4) Distribution of crabs (*Cancer amoenas*).
- (5) Crab behaviour.

Bayne, P. M.—Observations on a trip to the head of the Bay of Fundy.

Beatty, S. A.—The chemistry of fish muscle proteins.

Berrill, N. J.—Digestion in ascidians and the influence of temperature.

Bere, R.—The external fish parasites of Passamaquoddy bay.

Daggett, E. E.—

(1) Report on the canning of clams.

(2) Report on the smoked fish industry of Charlotte Co.

(3) Report on salting haddock with hake to prevent the haddock from burning.

(4) A report on the handling of fresh fish and the preparation of dried fish in and about the waters of Passamaquoddy bay and the Bay of Fundy.

Davidson, V. M.—The relationship between the abundance of diatoms and sunlight intensity in the vicinity of Passamaquoddy bay for four consecutive years.

Dow, Dorothy.—The effect of heat on fish muscle.

Ellis, M. F.—Report on the investigations on the protozoan parasites of the fishes of the St. Andrews region.

Frame, E.—A contribution to the study of the histology of the alimentary tract of the haddock (*Melanogrammus aeglefinus* Linnacus) and its absorptive function.

Gibbons, N. E.—The effect of autolysis in aseptic haddock muscle on the rate of bacterial decomposition.

Huntsman, M. E.—

(1) A study of the winter flounder. (*Pseudopleuronectes americanus* Walbaum).

(2) Some experiments on the eggs of the squid (*Loligo pealii* (Lessueur)).

Klugh, A. B.—

(1) The effect of the ultraviolet component of the sun's radiation upon some aquatic organisms.

(2) An ultraviolet photometer for field use.

Lloyd, F. E.—The occurrence and behaviour of the contractile vacuole in marine and marine entozoic protozoa.

Odell, E. C.—The correlation between light intensity, and the distribution of marine copepods.

Shaw, E. B.—Estimation of bound water in the muscle juice of fish.

Warren, A. E.—An ecological study of the sea mussel. (*M. edulis* Linn).

Wright, N. E.—Report on the general distribution of *Calanus finmarchicus* in the Bay of Fundy.

EXPERIMENTAL STATION AT HALIFAX, N.S.

STAFF

Dr. A. H. Leim, Director.

Mr. E. Hess, Bacteriologist.

Dr. H. R. Chipman, Chemist.

Mr. F. Watson, Fishery Demonstrator.

Miss A. M. Wilson, Technical Assistant.

Mr. E. F. Mitchell, Mechanician.

Miss M. M. MacPhee, Secretary.

Miss E. C. Alexander, Office Assistant.

Mr. C. K. Darrach, Factor.

In addition there were a number of seasonal appointments:—

(1) *Scientific Assistants*—

Mr. D. LeB. Cooper.

Miss C. E. Rice.

Mr. G. O. Langstroth.

Mr. R. F. Ross.

Mr. H. R. Wyman.

(2) *Assistants for Technical Processes*—

Mr. W. W. Stewart.

Mr. K. W. Mahen.

(3) *Technical Assistant (Chemical)*—

Miss A. M. Wilson.

(4) *Laboratory Assistants*—

Mr. E. W. Barnstead.

Mr. E. Baker.

There was one volunteer investigator, viz., Mr. H. B. Branion, University of Toronto.

INVESTIGATIONS

1. *Refrigeration*

The main problem being attacked by the Station was that of refrigeration and a number of lines were pursued to give data on the rate of freezing of various fishes, the proper storage temperature subsequent to freezing and the effect of low temperatures, just above freezing, on the growth and action of putrefactive bacteria.

Mr. Hess and Miss Rice carried through experiments on the latter point which indicated the value of maintaining the lowest possible temperature without causing the fish to freeze. As a practical test a holding tank was designed by means of which two per cent brine could be circulated through ice and cooled to 30.5° F. Fish immersed in this brine were held as long as two weeks in good condition. They were from 4 to 8° F. lower in temperature than is usual in fish stored in ice. A culinary and chemical test was made comparing fish held in the two ways showing the marked improvement with the lower temperature.

Mr. Langstroth determined the specific heat, latent heat of freezing and conductivity of various kinds of fish muscle. These figures enable one to check the efficiency of the equipment designed for freezing fish and to predict the time required to freeze under any given conditions.

Mr. Wyman began and carried on during the summer of 1928 an experiment on the storage of fish at different temperatures between 23° and -4° F. This has been carried on further by the Director. Briefly the results are that in eight months the fish at 23° F. although frozen had become badly decomposed and rusted, with moulds and bacteria growing on them, while those held at -4° F. were still of good flavour and appearance. It has also been shown that a constant temperature was very important in preventing evaporation and other water transfer within the muscle.

2. *Smoking*

Mr. Cooper's investigations on the chemistry of smoke consisted chiefly in a search for satisfactory methods of analysis for formaldehyde in smoke. The current analyses are influenced by the various other aldehydes present. Believing that formaldehyde is an important substance in the smoking of fish it is desirable to know how to produce a smoke with various quantities of formaldehyde present. A method was found which gave promise of being a reliable method of analysis.

Late in the year Mr. Hess began work on the applications of the knowledge already available with a view to designing a more modern plant for the smoking of fish.

3. *Salting and Drying*

The chief investigations in this field were those of Dr. Chipman on the action between salt and protein of fish muscle. The work had in mind particularly an explanation of the differences in the various cures and the ascertaining of what is responsible for the different action of commercial salts. The rate of penetration and water removal with most of the salts on the market has been determined.

Dr. Chipman prepared a draft of a Bulletin on the "Preparation of Pickled Mackerel."

Mr. Mahen, after visiting various plants, wrote up an account of the method of preparing boneless fish. This information is to be made available in Bulletin form.

Miss Wilson made analysis of samples of most of the commercial salts on the market. These are repeated from time to time to check up on the variations in each brand.

4. *Canning*

Mr. Hess carried out an experiment on the effect of storage temperature on canned lobster, using a range of from 32 to 95 degrees Fahrenheit. It was demonstrated that a low temperature was somewhat beneficial to the colour of the product.

Mr. Ross studied the influence of salt solutions and temperature on the shrinkage of lobster and fish muscle. This was undertaken to throw some light on the shrinkage which takes place in canned fish during processing.

5. *Fish Meals*

Mr. Stewart investigated methods of manufacturing fish meal. He spent the greater part of the summer of 1928 at the Atlantic Biological Station, St. Andrews, N.B., investigating difficulties encountered in the plant of Connors Bros., Ltd., of Blacks Harbour. The problem resolved itself into one of the factors controlling the expressing of the oil from the brined, cooked fish.

Dr. Chipman and Miss Wilson analysed commercial samples of fish meal which were submitted for that purpose by the trade.

6. *Fish Oils*

Mr. Branion prepared oil from the livers of cod, haddock, hake, ling and dogfish, testing the effect of storage for various times and temperatures. The oils were then tested for colour and taste. They were subsequently taken to Toronto for Biological assay of the vitamine content.

Mr. Stewart visited plants and reported on modern methods of extracting cod liver oil at Perce and Fox River, Que.

DEVELOPMENT OF THE STATION

No major building operations were conducted during the year. Certain additional equipment was placed in the chemical laboratory to permit of greater numbers of workers being accommodated.

In the Demonstration building the conveyer apparatus was completed on a brine freezing tank of commercial size. A holding tank for about 600 pounds of fish was built for the use indicated above.

ICE FILLETS

The process of rapidly freezing fish, so that its original flavour and condition may be retained months afterwards, is quite well known and is not new. The Board, however, has been experimenting with and demonstrating a method of rapidly freezing fillets of haddock in half-pound blocks, placing these in pound cartons and marketing them. The name "Ice Fillets" has been given to fish so put up. The characteristics of ice fillets are as follows:—

1. They are strictly fresh.
2. They are without waste materials, such as skin and bones.
3. They are of uniform thickness, and of size and shape suitable for cooking, such as frying, without cutting or subdivision of any kind; of standard weight such as half-pound.
4. They are frozen rapidly in less than twenty minutes, so as to avoid damage through formation of large ice crystals.
5. They are maintained in this frozen condition to the time of cooking, and at sufficiently low temperatures to prevent deterioration.
6. They are sanitarily wrapped in waxed, parchment paper, and neatly packaged in one pound cartons.

Briefly, the process is as follows:—

The fish are first filleted and then cut into five-inch lengths. These are fed into a machine which presses them into cakes five inches long, three inches wide

and approximately one inch thick. The cake is then wrapped in waxed, parchment paper, and frozen in forms the size of a cake in thin metal envelopes in brine. The temperature of the brine is maintained at zero fahrenheit by means of ice and salt, or ammonia refrigeration. The brine is kept moving, and the fish are frozen to the centre in about fifteen minutes. The frozen cakes are placed in cartons, and stored in a room at about zero temperature. The cakes are maintained in this condition during transportation, and in the retail stores, so that the consumer receives them still frozen.

It may be noted that during January and February of this year the Board marketed several tons of these ice fillets in Toronto as a demonstration to the industry. From the start the demand for these fish was so much in excess of the supply that all advertising measures had to be dropped, and so it became early apparent that there is a big undeveloped market for such a high quality of product as strictly fresh fish in an up-to-date form convenient for handling and cooking. Families who previously have used little or no fish were induced to buy this package regularly. No fish firms have so far attempted to market quick frozen fillets, but the Board is arranging to assist and supervise the installation of quick freezing plants by firms on the Atlantic coast, and to furnish all available information to enable them to produce a saleable article.

EDUCATIONAL WORK

Two Courses of Instruction were given during the year 1928-29.

1. Course for Fishermen: January 16 to February 25, 1929. There were sixty-six applicants to take this course of whom twenty-five were chosen. The courses included science, motor engines, navigation, natural resources, preparation of dried and boneless fish, preparation of pickled fish. An examination was held at the termination of the course.

2. Course for Departmental Overseers: Began on March 6, 1929, and was still in progress on March 31. Attended by three inspectors, seventeen overseers and five officials from Quebec. Courses included biology, chemistry and physics, bacteriology, principles of smoking, principles of refrigeration, preparation of dried and boneless fish, preparation of pickled fish.

The station prepared an extensive exhibit in connection with an exhibition of scientific methods by the Nova Scotian Institute of Science on November 24 and 25, 1928.

Mr. Watson demonstrated methods of preparing boneless fish to a firm in Lunenburg during October, 1928.

FIELD WORK

Dr. Huntsman was in Petit de Grat on May 4, 1928, to address a meeting of fishermen.

Dr. Chipman visited the hatchery at Middleton in June, 1928, investigating the water supply. Dr. Huntsman and Dr. Leim examined the water supply at the Windsor hatchery a number of times during the year following the quarry pollution of the water supply.

Dr. Leim visited the plant of the Lockeport Company on May 15 in connection with the installation of a brine freezing tank.

Dr. Huntsman was in Yarmouth in August, 1928, conferring with the trade there, particularly with a view to the formation of an Advisory Committee of the station in that place. Dr. Leim visited Yarmouth in January giving information to the Board of Trade and other interested parties in connection with brine freezing.

PUBLICATIONS

The following publications dealing with the work of the Station appeared during the year:—

- Chipman, H. Ritchie.—Fundamental Principles of Chemistry and Physics. Bull. Biol. Board of Canada, No. 11, 1928.
Hess, Ernest.—The bactericidal action of smoke (as used in the smoke curing of fish). Contrib. to Can. Biol. N.S. Vol. 4, 1929.

MANUSCRIPT REPORTS RECEIVED DURING THE PERIOD

- Hess, E.—Report on the Course for Lobster Cannery Foreman, 1928.
Chipman, H. Ritchie, and Langstroth, G. O.—The heat capacities and specific heats of cod-fish and haddock between 70° C. and -70° C.
Chipman, H. R., and Mahen, K. W.—Notes on the extraction of cod liver oil.
Chipman, H. R., and Leim, A. H.—Report on the Course for Fishermen, 1928.
Chipman, H. R.—The penetration of fish muscle by salt, interim report.
Ross, R. F.—A preliminary study of the shrinkage of crustacean and fish muscle when exposed to changes in salt concentrations and temperatures.
Langstroth, G. O.—Preliminary work on the specific conductivity of fish muscle.
Langstroth, G. O.—Heat capacity of fish muscle, latent and specific heats.
Hess, Ernest.—Experiments with nitrogen gas as a means of holding fresh fish.
Stewart, W. W.—The extraction of oil from cod livers at Perce, Quebec, oil plant operated by Robin, Jones and Whitman Co.
Hess, E.—Test of commercial 'quick drying water proof' inks for printing on tin cans.
Stewart, W. W.—Report on Robin, Jones and Whitman cod liver oil plant at Fox River, Gaspé Co., Quebec.
Wymen, H. R.—The effect of temperature of cold storage on the expressible fluids in fish muscle.
Stewart, W. W.—Preliminary report on the processing of fish meal.
Stewart, W. W.—References to literature pertaining to fish meal.

PLANKTON AND HYDROGRAPHIC

Regular observations were taken throughout the year at two stations situated in Halifax harbour and Bedford basin. Similar observations were taken at intervals at stations near the entrance to the harbour during the fishing season.

EASTERN PASSAGE LABORATORY

The constructional work carried on during the year at this laboratory was done by the Department and inspection of the work as it proceeded was all that came directly under the station. Plans for outfitting were made and certain equipment was ordered.

BIOLOGICAL STATION AT NANAIMO, B.C.

STAFF

- Dr. W. A. Clemens, Director.
Dr. R. E. Foerster, Biologist for Fish Cultural Investigations.
Dr. H. C. Williamson, Biologist for Herring and Pilchard Investigations.
Mr. A. L. Pritchard, Biologist for Salmon Investigations.
Mr. G. H. Wailes, Temporary assistant Pilchard Investigation.
Mr. C. McC. Mottley, Temporary assistant Trout Investigation.
Mr. L. L. Bolton, Temporary assistant Salmon Tagging.
Mr. W. F. Baxter, Temporary assistant Salmon Tagging.
Mr. M. MacPhail, Temporary assistant Salmon Tagging.
Mr. J. L. Kask, Temporary assistant Clam and Salmon Investigation.
Miss E. Keighley, Secretary.
Mr. Fred. Groth, Captain *A. P. Knight*.
Mr. R. G. Good, Engineer *A. P. Knight*.
Mr. T. Russell, Caretaker.
Mr. Edgar Black, Laboratory Assistant (summer).
Mrs. E. Riches, Cook.
Miss Winnie Riches, Maid.
Miss Edith Riches, Maid (summer).
Miss M. Ross, Maid (summer).

The workers at the station have been:—

- Miss A. Berkeley, University of Toronto: The life histories of prawns and shrimps.
 Mr. C. Berkeley, Nanaimo: Marine bacteria.
 Mrs. C. Berkeley, Nanaimo: Polychaet worms.
 Miss M. Campbell, University of British Columbia: Quantitative study of the zooplankton in the Strait of Georgia.
 Mr. I. E. Cornwall, Victoria: Sponges.
 Professor J. R. Dymond, University of Toronto: Marine fish.
 Mr. C. R. Elsey, Oak Bay High School: Oyster Propagation.
 Mr. C. A. E. Hensley, Winnipeg: Growth of Marine diatoms.
 Professor A. Hunter, University of Toronto: Distribution of Arginase in fishes.
 Dr. A. H. Hutchinson, University of British Columbia: The distribution of Plankton in the Strait of Georgia.
 Mr. C. C. Lucas, University of Toronto: Physico-chemical conditions in the Strait of Georgia.
 Mr. C. McC. Mottley, University of Toronto: Trout Investigation.
 Mr. J. A. Munro, Okanagan Landing: The food of sea fowl in relation to the spawning of herring.
 Dr. W. W. Simpson, University of Toronto: Functions of the liver in fish.
 Miss G. M. Smith, University of British Columbia: The food and food supply of commercial clams.
 Mr. G. H. Wailes, Vancouver: Plankton and amphipod studies.
 Mr. G. V. Wilby, N.D., Agricultural College: Life-history of ling cod.

FIELD INVESTIGATIONS

1. *Propagation of Sockeye Salmon*.—Dr. Foerster continued his studies at Cultus lake. In the spring of 1928 the yearlings resulting from the fry planting were enumerated as they passed out of the lake and a considerable proportion were marked. In the fall the adults coming to the lake were counted. Following the program as previously laid down, all the fish were stripped. A considerable number of fish marked in 1926 have been reported by the canners and many more were recorded at Cultus lake.

2. *Herring and Pilchard Investigations*.—Dr. Williamson has given special attention to the occurrence and distribution of the plankton and its possible relation to the movements of herring and pilchards. Mr. G. H. Wailes has assisted in the quantitative and qualitative examination of the plankton collections. Mr. J. A. Munro, Chief Federal Migratory Bird Officer for the Western Provinces, spent several weeks continuing his studies of the foods of sea fowl in relation to the spawning of herring.

3. *Pink and Chum Salmon Investigation*.—Mr. Pritchard spent ten weeks in Masset Inlet and Naden Harbour, Queen Charlotte islands, studying the spawning conditions for pink and chum salmon and the racial characteristics and life histories of these species.

4. *Pacific Trout Propagation*.—Mr. Mottley spent April and May studying the spawning of Kamloops trout, especially at Paul lake. About the first of June he joined Prof. J. R. Dymond and together they studied the trout and trout areas in the vicinity of Cranbrook, Nelson, Okanagan lake, Kamloops, and Cultus lake. Some of the material was worked up at the station during August and the remainder is now being studied at the University of Toronto.

5. *Salmon Tagging*—

(a) Coho salmon—1,609 small individuals in the Nanaimo vicinity were tagged from February 14 to July 11 and 810 in the Queen Charlotte sound area from July 20 to October 11. Messrs. Baxter and MacPhail carried out this work. Messrs. J. H. Todd and Sons tagged 99 cohoes at their traps at Sooke, giving the fish without cost.

(b) Spring salmon—267 were tagged in the Nanaimo area and 133 in the Queen Charlotte sound area.

(c) Sockeye salmon—402 were tagged in the mouth of the Fraser river for the purpose of ascertaining if the fish bound for certain spawning areas arrived in the river within definite limited periods of time. Mr. L. L. Bolton was in charge of this experiment.

(d) Pink salmon—205 were tagged in the Johnstone strait area.

(e) Chum salmon—1,022 were tagged in the Johnstone strait area.

6. *Clams*.—Dr. C. McLean Fraser carried out an investigation of the razor clams beds on the north shore of the Queen Charlotte islands. He was assisted by Mr. J. L. Kask. Clam material was obtained from various beds in the vicinity of Prince Rupert and in the south at various points from Nanaimo to Sidney. Miss G. M. Smith made a special study of the foods of clams and the distribution of food materials.

7. *Oyster Propagation*.—Mr. C. R. Elsey continued his detailed studies of the propagation of the Japanese oyster in Ladysmith Harbour.

8. *Pollution*.—Dr. A. H. Hutchison and Mr. C. C. Lucas carried out a special investigation of an alleged pulp mill waste pollution on the west coast of Vancouver island.

9. *Sockeye Salmon Scale Studies*.—Dr. and Mrs. W. A. Clemens studied the collection of sockeye salmon scales of 1928 for the Provincial Fisheries Department. They also studied various collections made by the Fisheries Branch.

10. *Oceanographical*.—Dr. A. H. Hutchinson, Mr. C. C. Lucas and Miss M. Campbell continued their studies of the oceanographical conditions in the strait of Georgia. Dr. H. C. Williamson has been obtaining much data along the west coast of Vancouver island in connection with his herring and pilchard studies. The usual stations have been maintained, namely, Station Wharf, Strait of Georgia, Strait of Juan de Fuca, Prince Rupert Harbour, Fraser River.

EDUCATION AND PUBLICITY

Addresses were given by members of the staff and investigators in Duncan, New Westminster, Cranbrook, Nelson, Chilliwack, and Nanaimo.

Papers were read at the meetings of the American Fisheries Society in Seattle by Dr. Clemens, Dr. Foerster, and Professor Dymond.

About 800 persons visited the station museum during the year. These included a party of British school girls on an educational tour, the members of the Burrard Natural History Society, Vancouver, and the members of the Cowichan Natural History Society, Duncan. Newspaper articles have appeared in the Vancouver *Sunday Province* and in the Vancouver *Daily Star*.

CONFERENCE

During the first week in September a conference of the board's investigators on the Pacific coast was held at the University of British Columbia. Fourteen investigators and four visitors were in attendance. Reports of investigations being carried out were presented followed by discussions. Dean Brock gave an evening address.

VISITORS

During the year a number of visitors came to the station. These included: Prof. H. H. Gran, University of Oslo, Norway; Prof. V. E. Shelford, University of Illinois; Prof. J. P. McMurrich; Prof. W. T. MacClement; Mr. John Dybhavn; Mr. A. W. Neill, M.P., Alberni; Prof. F. C. Harrison, McGill University; Prof. H. A. MacTaggart, University of Toronto; Prof. R. H. Clark, University of British Columbia; Prof. T. G. Thompson, University of Wash-

ington; Prof. R. C. Miller, University of Washington; Dr. Mary McHugh, Liverpool; Dr. Ann H. Morgan, Mount Holyoke College; Dr. Elizabeth Adams, Mount Holyoke College; Mr. E. Norcross, Vancouver; Magistrate J. W. Winsor, Huntington, B.C.; Mr. Napier Denison, Gonzales Observatory, Victoria; Mr. T. P. O. Menzies, Vancouver Museum.

PROPERTY DEVELOPMENT

A residence building has been erected during the year. This includes kitchen and diningroom arrangements and accommodation for staff and investigators and for station help. A hot water heating system has been installed in the Biological building.

EXPERIMENTAL STATION AT PRINCE RUPERT, B.C.

STAFF

Mr. D. B. Finn, Director.
 Doctor T. Ingvaldsen, Biochemist.
 Mr. H. N. Brocklesby, Organic Chemist.
 Mr. L. F. Smith, Associate Chemist.
 Mr. E. W. Powell, Assistant Chemist (summer).
 Dr. F. C. Harrison, Bacteriologist (summer).
 Professor W. Sadler, Bacteriologist (summer).
 Professor I. M. Fraser, Mechanical Engineer (summer).
 Mr. B. Stevens, Laboratory Assistant.
 Miss A. Wood (resigned), Secretary.
 Miss R. Gillies, Secretary.
 Mr. H. Richmond, Janitor.

BUILDINGS

The existing building on the Government wharf contains well-equipped, chemical and biochemical laboratories and steps have been taken towards the establishment of a complete bacteriological laboratory. All of the working space in the building is now taken up and it will be necessary to secure an additional building, which will relieve crowded conditions and provide for future expansion.

INVESTIGATIONS

The investigations undertaken by the station during the past year may be grouped into two divisions, one dealing with the preservation of fish and the other with the development of by-products.

Preservation

The studies concerning preservation included refrigeration and the discoloration of halibut in the holds of fishing vessels.

Refrigeration

Demonstration Plant.—Since funds were not available, the development of a quick freezing apparatus for Pacific fish was postponed. This work will be commenced during the coming year.

Storage.—The investigation concerning the changes which occur in frozen fish during cold storage has been carried on under the following heads:—

- I. An Examination of the Chemical Changes which Occur in Fish during Cold Storage.
 - (a) A Study of the Changes which Occur in the Oils and Fats.
 - (b) A Study of the Effects of Low Temperatures on Fish Proteins.
- II. A Study of the Chemical Changes which Occur in Fish Oils during Rusting.

These investigations are all concerned with the storage of frozen fish, a field which is urgently in need of research since very little is known about the

causes of the deterioration which frozen fish undergoes. The work has been somewhat hampered by lack of controlled cold storage rooms. This defect will be remedied during the coming year by the installation of such rooms in the new building.

Discoloration of Halibut

The yellow discoloration of the halibut in the holds of fishing vessels has meant a tremendous annual loss to the fishing industry of the Pacific coast.

A preliminary investigation carried out by the station in 1927 indicated the necessity for a complete bacteriological examination of the fish from the time they were caught to the time of shipping or freezing.

The services of Doctor F. C. Harrison of McGill University and Prof. W. Sadler of the University of British Columbia were secured for the summer months of 1928.

These investigators isolated an organism *pseudomonas florescens* which is responsible for the discolouration. They found that though all vessels and fishing tackle was heavily infected, the organism did not occur on the fish as they came from the sea, but that it had its origin in the fresh water from which the ice used in the vessels was made. On examination, it was found that all of the ice made on the Pacific coast of Canada and Alaska is infected with the organism which is not only capable of surviving the low temperature of freezing but grows actively at a temperature of 34° F.

It was also found that chlorination of the water to a slight extent effectively killed the organism. Thus a ready means is available for preventing the initial infection.

During the coming summer, the investigation will be extended. A technique must be found for cleaning the already heavily infected vessels and a chlorinating process applied to the water with which the vessels are washed and from which the ice is made.

By-Products

The work on by-products has included a study of fish oils and meals and an examination of the waste press liquors from fish meal plants with a view to the recovery of nitrogenous products. The work on fish oils has included:

I. A Study of the Physical and Chemical Characteristics of Pilchard, Salmon and Dogfish Oils.

II. The Use of Fish Oils in Paints.

(a) The Bodying of Fish Oils by Heat and Blowing.

(b) The Character of Paint Films Prepared from Pilchard Oil.

A preliminary paper on the Physical and Chemical Characteristics of Pilchard Oil is now on press and considerable data has been obtained with regard to Salmon and Dogfish oils.

The work on the use of fish oils in paints is very promising. Paints have been manufactured and are being tested at Prince Rupert and at Saskatoon through the courtesy of the University of Saskatchewan.

III. An Investigation of the Vitamin Content of Fish Oils.

(a) The Vitamin A Content of Dogfish Liver Oil.

(b) The Vitamin D. Content of Dogfish Liver Oil.

(c) The Irradiation of Dogfish Liver Oil.

(d) The Vitamin D. Content of Pilchard Oil.

Papers have been published in *Canadian Chemistry and Metallurgy* dealing with the Vitamin A and D Content of Dogfish Liver Oil. The work on irradiation and that of the vitamin potency of pilchard oil is nearing completion.

Fish Meals.

The production of fish meals has increased tremendously on the Pacific coast during the past few years. In 1928, the pilchards caught for this purpose alone were valued at \$2,563,137.

The station has undertaken a thorough study of fish meals from various sources with a view to extending markets and improving methods of production. The study has been made as follows:—

- I. The Analysis of Fish Meals including a Determination of the Nitrogen Partition and the Content of Essential Amino Acids.
- II. A Study of the Effect of Putrefaction of Raw Materials upon Fish Meals.
- III. A Study of the Effect of Various Methods of Drying upon the Analysis and Nutritive Value of Fish Meals.
- IV. The Biological Value of Fish Meals.
- V. The Influence of Fish Meals upon Growth.

Papers dealing with the first three of these heads have been published and work on the Biological Value and Influence upon Growth is proceeding.

Press Liquors.

Press liquors are the watery fractions which are pressed from the cooked fish in the production of fish meal. These liquors contain from 30 to 50 per cent of the total nitrogen of the fish. Thousands of tons of this liquor are thrown away annually. From the standpoint of sheer enormity of loss, this waste would bear investigations. The station is undertaking an investigation with a view to the production of fish glue from this material. The study includes the following:—

- I. The Analysis of Waste Press Liquors from Fish Meal Plants.
- II. The Preparation of Glues from Fish Heads and Offal.
- III. A Study of the Influence of the Various Constituents of Press Liquors upon Fish Glues.

Various glues have been made and tested by the Forest Products Laboratory, Vancouver, through the courtesy of the Director. Present indications are that it is possible to make a good fish glue from halibut head. Production on a large scale is being made in order to examine the feasibility of the process.

PRAIRIE LAKES INVESTIGATIONS

I. *Alkaline Lakes of Saskatchewan.*—A small experimental hatchery with running water from Little Quill lake was established near the shore of this lake. Whitefish and cisco were taken from Quill lake and eggs were artificially fertilized. In January larger part of eggs were frozen in jars, but all that were not frozen were separated (several hundreds), and placed in one jar. During the earlier part of March 85-90 per cent of these eggs hatched. All the fry were vigorous and normal. The eggs were fertilized in alkaline water, and our experiments show that the sperms of whitefish and cisco can live in alkaline water for about fifteen minutes. This indicates that each of these species may complete its life cycle in the Quill lakes.

II. *Whitefish Investigations.*—The following is a short summary of the report on whitefish investigations:—

During the last twelve years the number of whitefish in the lakes of the Prairie Provinces has remained approximately constant and is as follows:—

- In lake Winnipeg, about 6,000,000.
- In lake Winnipegosis, about 2,000,000.
- In lake Manitoba, about 500,000.

The daily consumption of food by whitefish is about 10 gr. per individual. The total amount of food supply in lake Winnipeg is quite sufficient for 90,000,000 fish, in lake Winnipegosis, approximately for 20,000,000 fish, and in lake Manitoba, for 10,000,000, that is ten times as many as there are now.

The mortality rate of fertilized eggs and fry, under natural conditions, is very great, somewhere about 99 per cent.

The production of the prairie lakes can be increased very considerably by means of artificial fish culture, but only if the whitefish fry are cared for, for a period of at least one month. The highest mortality of fry is just after hatching. No considerable migration of whitefish takes place from one lake to another.

III. *Fish Parasites*.—There have been recorded several cases of large tapeworm from pickerel meat of the prairie lakes. Three hundred adult pickerel, from lake Winnipeg, and lake Manitoba, were carefully examined during the winter months. From lake Winnipeg only three infected fish have been obtained. Fifteen fish from lake Manitoba were examined early in May. Two of them were found to be infected with parasites. As infections with tapeworm occur mostly during the summer months, further investigation into the percentage of infected fishes will be made during the following season.

IV. *Pickerel Investigation in Lake Manitoba*.—A preliminary report on the pickerel investigation is submitted. During last summer and this spring a good deal of data concerning food, rates of growth, spawning, etc., was obtained. It should be noted that the low percentage of fertilized pickerel eggs in hatcheries is due probably to the comparatively short life of the sperms.

A full report will be submitted later.

PROGRAM FOR THE COMING SEASON

1. *Alkaline Lakes*.—Transferring the experimental hatchery to Big Quill lake, for investigating the problem of the fertilization and hatching of whitefish and cisco fry, in waters of a higher salinity.

Determination, by means of small meshed gill-nets, of the approximate amount of young whitefish and cisco hatched in the Quill lakes, under natural conditions.

2. Detailed investigation of the northern part of lake Winnipeg, Nelson river, and other important lakes in the prairie provinces, in connection with whitefish and other commercial fishes.

3. Fish parasites.

FISH CULTURAL INVESTIGATIONS

Investigations in connection with fish culture embrace nearly all the work in the fresh waters of the Dominion as carried on under the board. Some of the simpler facts in connection with these various investigations are the following:—

Brook Trout Investigation.

Mr. H. C. White followed the results of the planting of trout fry in Forbes creek, P.E.I., for information in two directions. In the first place a comparison was made of the effectiveness, either of protecting them from large fish (trout), or of removing them from competition for food with other small fish (sticklebacks) in reducing the death rate. The results gave a reduction of about 30 per cent in the percentage of deaths in the former case, and of about 6 per cent in the latter case. In the second place the importance of having the fry spread over a considerable area was investigated by planting 111,333 and 1,000 fry in three different ten-rod sections and determining the percentage surviving by the end of the season, which proved to be 44 per cent, 21 per cent and 15 per cent respectively.

Various hatching experiments were made. The eggs were found to stand temperatures close to the freezing point without loss, but not below. Dropping eggs into pans caused injury followed by death, in unhardened eggs only when from a height of eighteen inches with all killed if the height was four feet, but in hardened eggs some died when dropped only two inches, and all when dropped eighteen inches.

Atlantic Salmon Investigation

Mr. R. B. Kerr began a study of the life and growth of the salmon, obtaining material from the fishery near Saint John, N.B. He also studied the mortality in salmon fry kept at the Atlantic Biological Station, and found that the Chamcook lake water as delivered there through extensive piping was injurious, particularly to the smaller ones.

Smelt Investigation

Dr. A. H. Leim examined tows made in the Magaguadavic river, N.B., by the Atlantic Biological Station, and determined that there was not much difference to be found in the numbers of smelt fry in that river between the season of 1927 when an attempt was made to salvage from two to four million eggs in a floating pan and the season of 1928, when no such effort was made. It would seem that the number of eggs salvaged will have to be much greater to show a definite influence.

Shad Investigation.

Mr. A. A. Giffin investigated the spawning of the shad in the Saint John river, N.B., and found large numbers of eggs below Grand Falls indicating considerable spawning at that point, but none was demonstrated in the neighbourhood of Gagetown. Very little success was obtained in demonstrating successful spawning by the discovery of the shad fry. Nearly all the many small clupeoids caught were found to be alewives, and less than three dozen shad were taken, these mostly in the Beechwood-Florenceville section.

Pond Investigation in Connection with the Rearing of Fry

Mr. W. S. Hall followed the physical and biological conditions in a series of four artificial cement ponds with stagnant water at the Atlantic Biological Station. The experiments were designed to show the effects of (1) partial shading, (2) treating with sea mussels as a fertilizer, and (3) treating with barnyard manure as a fertilizer, all in comparison with the unshaded and untreated state. In the latter (the control pond) there was very little life, light penetrated to the bottom (six feet) and the temperature was very uniform throughout, frequently warming and cooling again, which mixed the surface and bottom water ensuring very full oxygenation. The shaded pond was rather similar, but lower in temperature. The pond fertilized with mussels was very full of plant and animal life, which kept the light from penetrating, so that the bottom water remained cool, and from the decomposition became quite poor in oxygen. On the other hand the very rich plant growth in the upper layers gave a super-abundance of oxygen. The manure in the remaining pond in part floated to the surface, so that decomposition occurred throughout with a very small amount of oxygen left except quite near the surface, where alone were the conditions suitable for any particular amount of plant and animal life. This pond had the coldest bottom water.

Hatchery Investigations

A new method of carrying eggs during the period of development was devised by Dr. Huntsman and tried out at the Bedford hatchery near Halifax by Dr. Leim. Trout and salmon eggs were carried in trays with still water, temperature being controlled by water running over a metal hood which

enclosed the trays. A certain amount of success was obtained, but further experiments will be required. The object of this method is to provide a means of carrying eggs through on a large scale, where running water of the proper nature (apart from temperature) is not available.

The water supply of the hatchery at Middleton, N.S. was investigated repeatedly by Dr. Leim in an attempt to determine whether it can be made safe for hatching the fish eggs. Water of rather high acidity issues under certain conditions from the neighbourhood of a plaster quarry and the origin and nature of this effluent, found to be fatal to the eggs, have been determined, but only in part.

Whitefish Investigation (Ontario)

Mr. J. L. Hart has continued his study of the life of the whitefish as it occurs in the bay of Quinte. The spawning grounds were investigated by the use of a diving suit and it was found that the eggs undergo in nature a rather heavy mortality during the winter, which was corroborated by experiment with a box, which was lowered to the bottom and which showed a winter loss of eggs of 36 per cent. The fry were found along the shores in moderate numbers, but there was no evidence that they were being eaten by other fish, which did however take the eggs.

Whitefish Investigation (Manitoba)

Mr. A. Bajkov has studied the population of whitefish in lakes Winnipeg and Winnipegosis, and the conditions, under which they are living. The numbers would seem to have kept fairly constant during the past twelve years. They grow at nearly the same rate in the two lakes and somewhat faster than do those of Lake Erie, and may attain an age of fifteen years or even more. The whitefish of the two lakes appear to be somewhat different in character, and there is no definite evidence of any migration from one lake to the other through the Dauphin river and lake Manitoba, although some fish ascend that river from lake Winnipeg for spawning purposes. In both lake Winnipeg and lake Winnipegosis the northern parts, which are deeper and cooler, are those more suitable for whitefish, and in summer particularly, when the high temperature and low oxygen content near the bottom appear to be responsible for the death of whitefish.

Tapeworm Investigation

An investigation was made by Mr. Bajkov of the occurrence in Manitoban fishes of a tapeworm that attacks man and that appears to have been brought to this continent from Europe. None were found in whitefish or cisco, but some did occur in the flesh of pickerel, pike and ling.

Pickerel Investigation

A study has been started of the pickerel in the lakes of Manitoba. In lake Manitoba it is the most important commercial fish, which is evidently correlated with the shallowness of that lake, whose waters are slightly alkaline and with greater salt content than in the case of the other two large lakes. The rate of growth of this fish in these lakes is such that it reaches a length of a foot in four years and of over nineteen inches in eight years.

Introduction of Whitefish and Cisco into the Quill Lakes, Sask.

Beginning with 1924 the department, on the recommendation of the Board has been stocking the Quill lakes, which are quite alkaline and of comparatively high salinity, with whitefish and cisco fry. Mr. Bajkov has followed the results of this introduction. The whitefish have grown to a maximum weight of four and one half pounds, and they have grown faster and are of better quality than those grown in the large Manitoban lakes, due probably to the

higher temperature and the greater abundance of food which is chiefly a species of *Corixa*. The whitefish were first ready to spawn in 1926, but it is not known that natural spawning has been successful. Experiments have, however, proved that not only do these fish mature in such saline water, but that the sperms from the males will fertilize the eggs of the females in such water, and the eggs thus fertilized will develop and hatch.

Investigation of Lakes in Prince Albert National Park, Sask.

Mr. D. S. Rawson conducted a survey of certain typical lakes and streams in this park, of which the chief were Waskesiu lake and the Beartrap Creek system. Waskesiu lake exhibits a stratified condition with a tendency to bottom stagnation, which appears to explain the absence of lake trout. Pike are the predominant fish and will require stringent regulations for conservation. Kingsmere lake of about the same size, but deeper, has less stratified water, and the bottom conditions are fresher, so that lake trout occur and may yield good angling. The streams are of less value, as they are either weedy, slow, and infested with pike, hence unsuitable for desired game fish, or else short, heavily shaded and barren of food materials, hence presenting poor angling possibilities.

Investigation of Lake Athabasca

Mr. G. C. Whiteley, Jr., visited this lake for a preliminary survey of the conditions. A collection of fish and plankton was made and water temperatures taken.

Pacific Salmon Investigation

Dr. R. E. Foerster with headquarters at Cultus Lake, B.C., continued the program for a long period study of the comparative effectiveness of natural and artificial propagation of the sockeye salmon. A count was made of the down-stream migrating young from the lake, which totalled 452,770, most of which are expected to have been the result of the spawning of the autumn of 1926, from which 5,916,524 fry were liberated in the following year. An analysis is being made to determine the proportion among the migrants of fish from such spawning. During the migration 99,701 sockeye were marked by fin removal to determine their fate as regards return as adults for spawning. Coho and pink salmon migrants were also counted and marked.

None of the adult sockeye reaching the lake in 1928 were permitted to spawn naturally, but all were retained for artificial propagation. From 8,099 fish (those lost by death not being included) 27,784,000 eggs were obtained and distributed to three hatcheries. A total of 443 returns were obtained from various sources, but principally at Cultus lake, of the sockeye salmon marked as yearlings at that lake in 1926.

Experiments with eggs, sperms, and hybrid salmon have been continued, and the conditions in Cultus lake, where the fry develop, are being followed throughout the year.

Pacific Trout Investigation

The trout in a number of localities in British Columbia have been studied by Professor J. R. Dymond, assisted by Mr. C. McC. Mottley. It is concluded that the so-called rainbow trout of British Columbia belongs to two species—the steelhead in the coastal area and the Kamloops trout in the interior. The latter runs into numerous geographical races in different parts of the province.

PUBLICATIONS

The following publications have appeared during the year in connection with the work on fish cultural research:—

- Dymon, J. R.—The trout of British Columbia. Trans. Amer. Fish. Soc., 1928.
- Neave, Ferris.—Reports of the Jasper Park Lakes Investigations, 1925-26, II. Plectopera. Contr. Can. Biol. & Fish., N.S., Vol. IV, No. 13.
- Bere, R.—Reports of the Jasper Park Lakes Investigations, 1925-26, III. The leeches. Contr. Can. Biol. & Fish., N.S. Vol. IV, No. 14.
- Neave, Ferris.—Reports of the Jasper Park Lakes Investigations, 1925-26, IV. Aquatic insects. Contr. Can. Biol. & Fish., N.S. Vol. IV, No. 15.
- Neave, F., and Bajkov A.—Reports of the Jasper Park Lakes Investigations, 1925-26, V. Food and Growth of Jasper Park Fishes. Contr. Can. Biol. & Fish., N.S. Vol. IV, No. 16.
- Wallis, J. B.—Reports of the Jasper Park Lakes Investigations, 1925-26, VI. The beetles. Contr. Can. Biol. & Fish., N.S. Vol. IV, No. 17.

REPORTS

The following reports have been presented during the year:—

- Kerr, Robert B.—Report of Investigations on the Atlantic salmon (*Salmo salar*) during 1928.
- Leim, A. H.—
- (1) Shad Investigations in 1928.
 - (2) Smelt Investigations in 1928.
 - (3) Examination of water supply, Windsor Hatchery, Windsor, N.S., October 25, 1928, November 18, 1928, and February 7, 1929.
- White, H. C.—Trout fry planting experiments in Forbes Brook in 1928.
- Whiteley, Geo. C.—Diary of expedition to Lake Athabasca, summer of 1928.
- Bajkov, A.—
- (1) Investigations in connection with the whitefish *Coregonus clupeaformis* (Mitchill).
 - (2) Preliminary report on Lake Manitoba pickerel investigations.
 - (3) Report on investigation of alkaline lakes.
 - (4) Annual report of Prairie Lakes Investigations.
- Hall, W. S.—
- (1) Supervision of Pond work.
 - (2) Movement in Ponds.
- Hart, J. L.—The natural history of the whitefish *Coregonus clupeaformis* (Mitchill).
- Rawson, D. S.—The game situation in Prince Albert National Park.
- Dymond, J. R.—British Columbia trout investigation.
- Chaisson, A. F.—A report on the lobster fishery in Northumberland Strait.
- Robertson, A. D.—Experiments on oyster growth, Hillsborough River, P.E.I., summer 1928.

APPENDIX No. 3

FISH CULTURE

ANNUAL REPORT BY J. A. RODD, *Director*

The fish cultural operations of the department during the calendar year 1928 were devoted almost entirely to the propagation of the more important fresh-water and anadromous food and game fishes, such as Atlantic salmon and speckled trout in the Maritime Provinces; whitefish, pickerel, cutthroat, rainbow, brown, and Loch Leven trout in the Prairie Provinces; and Pacific salmon—principally sockeye—cutthroat, Kamloops, rainbow and speckled trout in British Columbia. In response to an annually increasing public demand greater attention was paid to the propagation of game trout. Increased facilities for retaining and feeding fry, so as to afford a longer season for distribution, were provided at several establishments where such development was feasible.

The total distribution for 1928 was 59 per cent larger than it was during the preceding year, being increased from 295,283,782 to 470,302,380, an increase of 175,018,598. The number of each species distributed were:—

STATEMENT, BY SPECIES, OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1928

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings	Yearlings and older fish	Total distribution
<i>Salmo salar</i> —Atlantic salmon...	300	104,070	3,832,725	4,473,300	11,346,337	.....	19,756,732
<i>Salmo salar sebago</i> —Landlocked salmon.....				98,230		78	98,308
<i>Salmo irideus</i> —Rainbow trout.....		175,500	321,127		399,346	3,954	899,927
<i>Salmo clarkii</i> —Cutthroat trout.....			1,731,591		2,212	9	1,733,812
<i>Salmo rivularis</i> —Steelhead salmon.....		12,083	164,760				176,843
<i>Salmo rivularis kamloops</i> —Kamloops trout.....		1,117,975	1,036,661		3,656		2,158,292
<i>Salmo trutta levenensis</i> —Loch leven trout.....				46,096	483,398	9,419	538,913
<i>Salmo fario</i> —Brown trout.....					472,143	4,760	476,903
<i>Oncorhynchus nerka</i> —Sockeye salmon.....		33,041,965	50,359,788	550,000	4,687,237	1,992	88,640,982
<i>Oncorhynchus tshawytscha</i> —Spring salmon.....		544,000	313,500		218,077		1,075,577
<i>Oncorhynchus kennerlyi</i> —Kennerly's salmon.....			205,000				205,000
<i>Oncorhynchus kisutch</i> —Coho salmon.....		499,380					499,380
<i>Salvelinus fontinalis</i> —Speckled trout.....		276,400	654,268	546,000	3,079,834	5,171	4,561,673
<i>Coregonus clupeaformis</i> —Whitefish.....	3,225,000	100,000	125,858,026				129,183,026
<i>Cristivomer namaycush</i> —Salmon trout.....			32,617,000			12	12
<i>Stizostedion vitreum</i> —Pickerel.....	187,680,000						220,297,000
	190,905,300	35,871,373	217,094,446	5,713,626	20,692,252	25,383	470,302,380

In addition to the distributions that were made from the hatcheries, twenty-six lakes and streams received allotments of fingerlings or older fish from other bodies of water. This work was very largely confined to the Prairie Provinces, where there are many districts which are not readily accessible to existing hatcheries, and many bodies of water of indifferent quality in which the higher class of fishes, such as are handled in our hatcheries, are not likely to live and thrive. This work involved the capture and transfer, in many instances for considerable distances, of 44,932 fish, comprising seven different species. The individual transfers were as follow:—

Waters Stocked	Transferred from	Stage	Crappie	Kamloops trout	Minnows	Perch	Pickarel	Rainbow trout	Sunfish	Totals
Anderson's lake, Sask., on S. 1-12, T. 45, R. 12, W. 2. " " " "	Stoney Lake.	Mature.				25				325
Coyote lake, Sask., S. 22, T. 10, R. 5, W. 2. " " " " " "	North Dakota Game and Fish Comm.	Mature.				300			42	42
Echo lake, Sask., S. 19-24, T. 40, R. 14, W. 2. Gordon's lake, Sask., S. 10-27, T. 45, R. 10, W. 3. " " " " " "	Stoney lake.	Fingerlings.	102							102
	Meeting lake.	Large.	7			2,000				2,000
	"	Yearlings.				20				20
	"	Fry.								
	"	Fingerlings.				160				160
Helen's lake, Sask., S. 20, 29, 30, T. 34, R. 2, W. 2. " " " " " "	Devils lake.	Mature.				10				10
	"	Yearlings.				400				400
Hudson Bay lake, Sask., S. 29, T. 27/a, R. 15, W. 2. Knutson lake, Sask., S. 31, 32, T. 49, R. 15, W. 3. Larsen lake, Sask., S. 1, T. 50, R. 16, W. 3. " " " " " "	Echo lake.	Mature.				25				25
	Murray lake.	Yearlings.				1,000				1,000
	"	Advanced fry.				1,200				1,200
Old Wives or Notoku Creek, Sask., S. 15, T. 11, R. 10, W. 3. Schlosser's lake, Sask., S. 17-18, T. 39, R. 25, W. 2. " " " " " "	Echo lake.	Advanced fry.				300				300
	Wakaw lake.	Yearlings.				1,500				1,500
	Burton lake.	Yearlings.				1,500				1,500
Stoney lake, Sask., or Humboldt lake, S. 31-34, T. 36 and S. 5, 6 of T. 37, R. 22, W. 2. Swede lake, Sask., S. 11-14, T. 40, R. 19, W. 3. Tadles lake, Sask., S. 14, T. 42, R. 10, W. 3. " " " " " "	Jackfish lake.	Yearlings.				1,000				1,000
	Murray lake.	Yearlings.				1,000				1,000
Wood river, Sask., 18 mis. north of Gravelbourg. " " " " " "	Echo lake.	Fingerlings.				3,800				3,800
	"	Advanced fry.				1,000				1,000
	"	Yearlings.				750				750
Wood river, Sask., 7 mis. S. E. of Gravelbourg. Bertha lake, Waterton Lakes Park, Alta. " " " " " "	Backwater adjacent to Bertha Creek.	Yearlings.				750		10		1,500
Cottage lake, Alta., S. 30, T. 52, R. 1, W. 5. Elkwater lake, Alta., S. 22-26, T. 8, R. 2, W. 4. Glory lake, Alta., S. 2-22, T. 53, R. 1, W. 5. " " " " " "	Lac la Poudre.	Mature.				27	45			72
	Razzie Dazzle Creek.	Mature.			700					700
	Mayatan lake.	5 inches to 9 inches.				50				50
	Lac la Poudre.	Mature.					55			55
R. 2, W. 3. Alta., S. 30-31, T. 58, R. 6, W. 5. Romeo lake, Alta., S. 36, T. 54, R. 1, W. 5. " " " " " "	"	Mature.				27	45			72
	Paul creek.	Mature.				46	36			82
	Phantun creek.	(2 year olds and yearlings.)		600						600
	Paul creek.	(2 year olds and yearlings.)		2,000						2,000
	Phantun creek.	(2 year olds and yearlings.)		21,000						21,000
	"	(2 year olds and yearlings.)		800						800
	"	"		600						600
Madeline lake, B.C., T. 17, R. 10, W. 6. Phantun lake, B.C., Kamloops District. Silent lake, B.C., S. 5, T. 21, R. 14, W. 6. " " " " " "	"	"								
Warren lake, B.C., T. 20, R. 15, W. 6. " " " " " "	"	"								
			109	27,000	700	16,890	181	10	42	44,932

In addition to the above the following private transfers were made:—

Water stocked	Transferred from	Transferred by	Stage	Large mouth black bass	Perch
Cooking lake, Alta.....	Mayatan lake.....	Cooking lake Cottagers.....	4 inches to 10 inches.....	200.....	62.....
Elkwater lake, Alta.....	Creston, B.C.....	Elkwater lake Cottagers.....	Yearlings and older.....	100.....	.....
Mayatan lake, Alta.....	".....	Northern Alberta Game and Fish Protective Association.....	".....	200.....	.....
Pigeon lake, Alta.....	".....	".....	".....	200.....	.....
Wabamun lake, Alta.....	".....	".....	".....	700.....	62.....

The seeding of isolated waters, to which it is not feasible to transfer fry from existing hatcheries, with eyed eggs was continued in British Columbia, and thirteen million and thirteen thousand sockeye salmon eggs collected in the Pemberton district below Hell's Gate on the Fraser were planted in the one-time spawning beds of such important areas as Stuart, Francois and Quesnel lakes in the upper Fraser above Hell's Gate. The whitefish hatching battery on the C.G.S. *Bradbury* was enlarged and utilized at the egg collecting camp at Dauphin river, Lake Winnipeg, in handling the eggs as they were collected there until they could be transferred and placed in the hatchery at Gull Harbour. This battery was again utilized for distribution purposes, and a considerable number of whitefish fry from the Gull Harbour hatchery, in the southerly portion of Lake Winnipeg, were distributed, as they hatched, much farther north and over a far more extensive area than would have otherwise been feasible.

Fish cultural officers are annually becoming more familiar with the waters in their respective distribution areas, which they regard as a farmer does his farm, and endeavour to seed them to the best advantage with the crops of fry and older fish that are annually available for that purpose so as to obtain the best result in mature fish. In addition to inspections by fish cultural officers, a considerable number of lakes and streams were also examined and reported on by the supervisors of fisheries and the fishery overseers, particularly in the Prairie Provinces. Copies of all reports of this nature are supplied in duplicate to the Chairman of the Research Committee of the Biological Board on Fish Culture for the information of the committee's workers in the respective districts. Several important inspections were made and detailed reports were submitted by the District Inspectors of hatcheries with regard to the possible effect of proposed power developments on spawning grounds; the introduction of non-indigenous species, the location of egg-collecting camps and hatchery sites. Inspections and investigations of a special nature are also referred to the committee as occasion arises.

Prospecting camps were operated at several points for the purpose of determining the possibilities for collecting eggs for fish cultural purposes. New hatcheries were opened in Antigonish and Yarmouth counties, Nova Scotia, and at Swan Creek, lake Manitoba. A description of these establishments is given elsewhere in this report.

At the close of 1928 there were thirty main hatcheries, ten subsidiary hatcheries, four salmon retaining ponds and several egg collecting stations, all of which are fully equipped, and have been in operation during 1928, with the exception of the newly constructed pickerel hatchery on lake Manitoba. The output from these establishments during 1928 was as follows:—

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH DURING 1928			
Nova Scotia—			
Atlantic salmon.....	6,292,421		
Speckled trout.....	1,382,345		
			7,674,766
New Brunswick—			
Atlantic salmon.....	11,955,588		
Brown trout.....	308,889		
Landlocked salmon.....	98,308		
Loch leven trout.....	64,213		
Rainbow trout.....	4,874		
Speckled trout.....	2,073,296		
			14,505,168
Prince Edward Island—			
Atlantic salmon.....	618,653		
Rainbow trout.....	11,409		
Speckled trout.....	413,355		
			1,043,417
Manitoba—			
Pickerel.....	200,727,000		
Whitefish.....	109,204,026		
			309,931,026
Saskatchewan—			
Brown trout.....	38,000		
Pickerel.....	19,570,000		
Whitefish.....	15,199,000		
			34,807,000
Alberta—			
Brown trout.....	130,014		
Cutthroat trout.....	1,512,483		
Loch leven trout.....	474,700		
Rainbow trout.....	565,502		
Salmon trout.....	12		
Speckled trout.....	190,774		
			2,873,485
British Columbia—			
Atlantic salmon.....	890,070		
Coho salmon.....	499,380		
Cutthroat trout.....	221,329		
Kamloops trout.....	2,158,292		
Kennerly's salmon.....	205,000		
Rainbow trout.....	318,142		
Sockeye salmon.....	88,640,982		
Speckled trout.....	501,903		
Spring salmon.....	1,075,577		
Steelhead salmon.....	176,843		
Whitefish.....	4,780,000		
			99,467,518
Total.....			470,302,380

MARINE AND FISHERIES

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING THE SEASON 1928

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings	Yearlings and older fish	Total distribution by species	Total dis- tribution by hatcheries
1876	Bedford.....	Halifax Co., N.S.....	Atlantic salmon.....	(b)	300		480,000	1,092,700		1,557,121	
1902	Margaree.....	Inverness Co., N.S.....	Speckled trout.....		4,070	51		819,500		2,240,000	2,381,671
1912	(a) Lindloff.....	Richmond Co., N.S.....	Atlantic salmon.....		5,050		775,000	1,465,000		2,240,000	
913	Middleton.....	Amnapolis Co., N.S.....	Speckled trout.....			746,000		106,900	428	1,07,328	2,347,328
1906	Windsor.....	Hants Co., N.S.....	Atlantic salmon.....				325,000	1,424,000		746,000	746,000
1928	Florenville.....	Carleton Co., N.B.....	Speckled trout.....		1,350	30,000	80,000	338,000	1,117	1,749,000	2,199,467
1880	Grand Falls.....	Victoria Co., N.B.....	Atlantic salmon.....			300	160,000	1,528,346		1,688,346	300
915	(a) Tobique.....	Victoria Co., N.B.....	Speckled trout.....			6,000	949,700	527,000	50	577,050	2,265,396
914	St. John.....	St. John Co., N.B.....	Atlantic salmon.....			180,000	240,000	1,686,950		2,624,650	3,408,262
			Atlantic salmon.....			665,000		363,612		783,612	665,000
			Brown trout.....				330,000	35,748		565,748	
			Landlocked salmon.....					304,143	4,746	308,889	
			Lochleven trout.....				98,230	8,698	78	98,308	
			Rainbow trout.....		500		45,096	8,698	9,419	64,213	
			Speckled trout.....			25,000	60,000	625,382	2,252	712,634	1,754,666
1874	Miramichi.....	Northumberland Co., N.B.....	Atlantic salmon.....		100,000			3,941,120		4,041,120	4,041,120
1874	Restigouche.....	Restigouche Co., N.B.....	Atlantic salmon.....			740,000	1,067,600	115,750		1,923,350	1,923,350
1906	Niniguit.....	Gloucester Co., N.B.....	Atlantic salmon.....			447,374				447,374	
	Kelly's Pond.....	Queens Co., P.E.I.....	Rainbow trout.....			345,000	206,000	67,653		618,653	447,374
1914	Gull Harbour.....	Big Island, Lake.....	Speckled trout.....					1,409		413,355	1,043,417
928	(d) Swan Creek.....	Winnipeg, Man.....	Pickeral.....			13,047,000	116,000	297,355		13,047,000	71,152,000
1909	Winnipegosis.....	Swan Creek, Lake.....	Whitefish.....	(b) 225,000		54,880,000				58,105,000	187,340,000
915	Fort Qu'Appelle.....	Manitoba, Man.....	Pickeral.....	187,340,000						187,340,000	
		Stake Island, Lake Winnipegosis, Man.....	Pickeral.....								
		Fort Qu'Appelle, Sask.....	Pickeral.....								
1914	Banff.....	Banff, Alta.....	Whitefish.....	340,000	51,099,026					340,000	51,439,026
			Brown trout.....					38,000		38,000	
			Pickeral.....							19,570,000	34,807,000
			Whitefish.....			15,199,000				15,199,000	
			Brown trout.....					130,000		130,014	
			Cutthroat trout.....			1,110,000			14	1,110,013	
			Lochleven trout.....					474,700	1	474,700	
			Rainbow trout.....					387,515	2	565,502	
			Salmon trout.....			177,985		12		12	
			Speckled trout.....						1	319,670	2,280,242
1917	(a) Spray Lakes.....	Spray Lakes, Alta.....	Cutthroat trout.....			319,670				319,670	319,670
1923	(a) Jasper Park.....	Jasper Park, Alta.....	Speckled trout.....							190,773	190,773
1927	Lesser Slave Lake.....	Lesser Slave Lake, Alta.....	(No distribution)								
1928	Waterton Lakes.....	Waterton Lakes Park, Alta.....	Cutthroat trout.....								
1916	Cultus Lake.....	Cultus Lake, B.C.....	Kamloops trout.....			82,800				82,800	82,800
1905	(a) Harrison Lake.....	Harrison Lake, B.C.....	Steelhead salmon.....		28,000	1,894				29,894	43,477
1922	(a) Lloyds Creek.....	Lloyds Creek, Kamloops District, B.C.....	Kamloops trout.....		3,543,965	1,500				3,543,965	3,543,965
					590,000	449,000				1,039,000	1,039,000

Year	Location	Species	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)
1906	Pemberton	Birkenhead River, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1917	Pitt Lake	Pitt Lake, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1908	Stuart Lake	Stuart Lake, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1903	Lakeelse Lake	Lakeelse Lake, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1908	Babine Lake	Babine Lake, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1906	Rivers Inlet	Owikeno Lake, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1911	Anderson Lake	Anderson Lake, Vancouver Island, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1911	Cowichan Lake	Cowichan Lake, Vancouver Island, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1911	Kennedy Lake	Kennedy Lake, Vancouver Island, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1914	(a) Gerrard	Trout Lake, Kootenay District, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1923	Nelson	Nelson, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1928	(a) Penask Lake	Nicola valley, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1928	(a) Summerland	Okanagan Lake District, B.C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(a) Subsidiary hatchery.

(b) All of these were planted from the 1928 Fall collection.

(c) 2,002,000 of these were planted from the 1928 Fall collection.

(d) Collecting camps.

Various experiments and investigations with equipment, methods, etc., and in feeding fry and older fish with different kinds of food in different combinations were conducted at several hatcheries. The nature of the experiments undertaken were as follows. Uncompleted experiments or work of this nature that did not develop improvements in existing equipment or methods are not referred to.

RIVERS INLET HATCHERY

F. A. Tingley, Superintendent

Eighteen experimental plantings of green sockeye salmon eggs from the collection of 1927 eggs gave the following returns:—

	Planted	Loss
No. 1 Water hardened eggs.....	1½ hours after spawning {	20
No. 2 Washed eggs, unhardened.....		11
No. 3 Eggs in milt.....		276
No. 4 Water hardened eggs.....	3 hours after spawning {	22
No. 5 Washed eggs, unhardened.....		28
No. 6 Eggs in milt.....		33
No. 7 Water hardened eggs.....	5 hours after spawning {	27
No. 8 Washed eggs, unhardened.....		22
No. 9 Eggs in milt.....		360
No. 10 Water hardened eggs.....	7 hours after spawning {	6
No. 11 Washed eggs, unhardened.....		39
No. 12 Eggs in milt.....		1,440
No. 13 Water hardened eggs.....	9 hours after spawning {	41
No. 14 Washed eggs, unhardened.....		6
No. 15 Eggs in milt.....		1,800
No. 16 Water hardened eggs.....	12 hours after spawning {	10
No. 17 Washed eggs, unhardened.....		3
No. 18 Eggs in milt.....		2,160
Total.....		6,304

The superintendent reports that screening of each planting was not undertaken until the fry were half developed to the free swimming stage, when they were found to have spread all through the gravel between the plantings. All plantings were therefore enclosed together by two screens and three traps were installed to catch the fry. From May 30 to June 22, eighty thousand three hundred and thirty-five fry were trapped. When the enclosure was practically clear of fry, each planting was dug up and picked over carefully and dead eggs from each planting were found as shown above. The definite results obtained in fry and dead eggs were as follows:—

Dead eggs counted or measured.....	6,304
Fry taken out of traps.....	80,335
Eggs or fry unaccounted.....	33,261

Total planted..... 119,900

Each planting contained one quart of hardened eggs—six thousand seven hundred, or an equal number of unhardened eggs, except No. 12, which contained six thousand. Part of the eggs unaccounted should be represented as dead eggs, particularly in plantings Nos. 12, 15 and 18.

It appeared that the loss in these three plantings was considerably in excess of the sum of losses from all the other plantings, but the superintendent was unable to prevent a large number of eggs in 12, 15 and 18 from drifting away, and only those that were counted or measured were included in the loss shown above. There were very few unaccounted dead eggs from the twelve plantings of water hardened and washed eggs, and in Nos. 16 and 17, which were planted twelve hours after spawning, there appeared to be as few dead as have ever been found in any planting of eyed eggs. There is no doubt that a considerable

number of the thirty-three thousand two hundred and sixty-one unaccounted eggs were hatched and had escaped down the stream bed beneath the screen.

From the results obtained it would seem that green eggs water-hardened, or washed only, can be planted to give as good results as can be obtained with eyed eggs. There seems to be nothing gained by leaving the eggs in milt, and if they are left in milt for seven hours before planting, the loss is very heavy. The eggs that were washed and placed in trays without being water-hardened were found to have hardened in the tray within twelve hours.

"Two lots of seven hundred and seventy-five eggs each were laid down in 1927 to show the difference in loss between the first and last eggs spawned from the same fish. The eggs from one fish were spawned into three pans in approximately equal parts and fertilized immediately in the usual way. Seven hundred and seventy-five eggs measured from the first lot and a like quantity taken from the last lot were placed in separate baskets in a trough, where the losses were recorded as they were picked. The loss from the first lot was 1.42 per cent and from the last 12.12 per cent. Obviously this is an extreme case, since the loss in seven hundred and seventy-five eggs, taken from the last one-third ($\frac{1}{3}$) spawned, is equal to about 3 per cent of the total yield of the fish."

"An experiment to determine the effect of exposure in water on the fertility of eggs and milt was repeated again in the autumn of 1928, under conditions slightly different from those obtaining in the experiment of the previous year. The following results were obtained:—

		Loss
No. 1 eggs fertilized with milt	1 min. in water.....	2.28%
No. 2 " " "	2 " ".....	13.00%
No. 3 " " "	3 " ".....	6.94%
No. 4 " " "	4 " ".....	77.75%
No. 5 eggs in water	1 min. before fertilization.....	32.85%
No. 6 " " "	2 " ".....	98.16%
No. 7 " " "	3 " ".....	90.80%
No. 8 " " "	4 " ".....	98.20%

Each of the eight lots above contained four hundred and ninety eggs. Lots one to four were made up of the eggs from one fish, spawned in a moist pan and thoroughly mixed before they were divided and fertilized. Lots five to eight were taken from another fish and treated in the same way before being divided into lots. By so mixing the eggs the mature and less mature are more equally divided among the different lots than they would be if each lot was taken as spawned from the fish. However, in mixing the eggs there is some exposure to water, so that the total time of exposure is greater than indicated in the table above; and probably the result of increased exposure is seen in No. 5 above which shows a loss of 32 per cent against only 7 per cent for the corresponding lot reported last year."

ANDERSON LAKE HATCHERY

David Bothwell, Superintendent

Six plantings of water-hardened sockeye salmon eggs from the collection of 1927 gave the following results. Each planting contained three thousand five hundred and eighty eggs:—

Length of time between spawning and planting	Number of fry liberated	Number of bad eggs
No. 1— 1 hour.....	3,224	356
No. 2— 3 hours.....	3,385	195
No. 3— 5 hours.....	3,144	436
No. 4— 7 hours.....	2,072	1,508
No. 5— 9 hours.....	3,424	156
No. 6—11 hours.....	3,481	99
	18,730	2,750

Five plantings of fertilized, washed, but not water-hardened, eggs gave the following results. Each planting contained four thousand seven hundred and thirty-eight eggs:—

ength of time between spawning and planting	Number of fry liberated	Number of bad eggs
No. 1—1 hour.....	4,315	423
No. 2—3 hours.....	4,076	662
No. 3—5 hours.....	3,749	989
No. 4—7 hours.....	4,555	183
No. 5—9 hours.....	4,372	366
	21,067	2,623

KENNEDY LAKE HATCHERY

W. P. Forsythe, Superintendent

Five plantings of sockeye salmon eggs were made from one to twelve hours after they were fertilized and gave the following results. Each planting contained one thousand eggs:—

Length of time between fertilization and planting	Number of fry counted
No. 1— 1 hour after fertilization.....	307
No. 2— 3 hours “.....	670
No. 3— 5 “ “.....	766
No. 4— 7 “ “.....	886
No. 5—12 “ “.....	534
Total.....	3,163 or 63·26%

Just before the commencement of the hatching period, screens were placed below the plantings to catch the emerging fry, which were counted out daily, the first on April 4 and the last on May 22. No. 1 planting became badly silted which undoubtedly caused considerable of the loss that occurred in it.

COWICHAN HATCHERY

J. H. Castley, Superintendent

Six plantings of fertilized but unhardened coho salmon eggs gave the following results. Each planting contained three thousand eggs:—

Length of time left in milt before planting	Number of live fish counted	Percentage of hatch
No. 1— 1 hour.....	1,653	55·1
No. 2— 2 hours.....	1,350	45·
No. 3— 5 hours.....	990	33·
No. 4— 7 hours.....	741	24·7
No. 5— 9 hours.....	1,076	35·86
No. 6—12 hours.....	1,166	33·86

ST. JOHN HATCHERY

J. D. Nichol, Superintendent

The following experiment in feeding canned salmon to fry and fingerlings was tried. The experiment began May 29, 1928. Three thousand were retained in each tank.

Species	Food	Experiment ended	Loss	Percentage loss
Speckled trout.....	All liver.....	Nov. 3....	922	30.7
“.....	Canned salmon and liver, 50% each.	“ 3....	702	23.4
“.....	Canned salmon.....	“ 3....	1,475	49.2
Atlantic salmon.....	All liver.....	“ 27....	779	26
“.....	Canned salmon and liver, 50% each.	“ 27....	865	28.8
“.....	Canned salmon.....	“ 27....	1,651	55
Brown trout.....	All liver.....	“ 27....	815	27.2
“.....	50% liver and 50% canned salmon...	“ 27....	1,431	47.7
“.....	Canned salmon.....	“ 27....	1,789	59.6

The fish fed all liver were by far the best. Those fed entirely on salmon were largely pin heads.

Tests of the following foods for speckled trout fingerlings were conducted. Two thousand fingerlings were fed from June 27 to November 3.

Food	Loss	Percentage Loss
Half clam meal and half liver.....	376	18.9
One quarter clam meal and three-quarters liver.....	300	15.0

Tests were also conducted with yearling speckled trout—two hundred in each retainer.

Food	Loss	Percentage Loss	Yield of Eggs
Liver.....	19	9.5	57,413
One-half clam meal and one-half liver.....	18	9.0	44,427
One-quarter clam meal and three-quarters liver.....	16	8.0	57,810
One-half liver and one-half fish.....	43	21.5	25,906
All canned salmon.....	45	22.5	22,302

Fifty each male and female speckled trout two years old, brood stock, were fed in four of the thirty-three-foot ponds from June 3 with the following results:—

—	Fed 3 lbs. liver per week	Fed 6 lbs. liver per week	Fed 9 lbs. liver per week	Fed 3 lbs. canned salmon per week
Females stripped.....	30	41	36	34
Males stripped.....	30	41	50	21
Loss in females.....	20	9	14	16
Loss in males.....	20	9	Nil	29
Yield per female.....	873	673	689	656
Total yield.....	26,190	27,610	24,812	22,302
Total loss to Feb. 11 in ova.....	2,910	2,776	2,097	1,251
Percentage loss to Feb. 11 in ova.....	11.1	10	8.4	5.6
Commenced spawning.....	Nov. 15	Oct. 27	Oct. 27	Oct. 27
Finished spawning.....	Nov. 29	Nov. 21	Nov. 21	Nov. 21

The fish fed the smallest quantity of liver produced more ova per fish but at a lower percentage of fertility. The difference in the cost of feeding between the three pound and nine pound groups was approximately five cents per fish. While the total collection obtained from those fed canned salmon was inferior to that obtained from liver fed groups, the percentage of fertility was considerably better.

In addition to the experiments, tests and investigations with equipment, methods, foods and breeding, that are continually underway at the various hatcheries, an extensive program of investigations and research—which is only limited by the difficulty that is experienced in finding properly trained workers to undertake definite problems of a fish cultural nature—is going on under the direction of the Biological Board of Canada. In spite of this handicap the following fish cultural problems are receiving attention and in some of them considerable progress has been made.

The Biological Board of Canada is in effect the scientific division of the Fisheries Department. It is composed of representatives from the leading universities of Canada, two representatives from the wholesale fish trade (one from the Atlantic and the other from the Pacific), and two Government officials. From the standpoint of scientific attainments, the board could scarcely be excelled, and consequently the scientific interests of the fisheries could scarcely be in better hands. A committee of the board (the Research Committee on Fish Culture) deals with fish cultural problems and reports to the board. The director, or head of the Fish Cultural Division is a member of the Research Committee on Fish Culture, and also a member of the Biological Board.

Considerable progress has been made in an investigation into the life-history of sockeye salmon. This investigation is to cover a period of twelve years ending in 1936, and, amongst other matters, will include a determination of the relative value and efficacy of different methods of artificial propagation and of natural reproduction; the value of ponds to enable the hatchery output to be artificially fed and distributed when they are one year old as compared with the value and results that accrue from the distribution of the same output in the fry and fingerling stages; the probable results and the advisability of transferring sockeye eggs from one system, or district, to another, such as from the Fraser to the Skeena river, and vice versa, and from the lower to upper Fraser river areas; the origin of unexpected and unexplained runs of sockeye that have occurred in recent years, and that may occur in the near future in the Fraser river system. The advisability of transferring pink salmon eggs or fry from the northern to the southern districts of British Columbia, and vice versa in the off years, with a view to producing equal runs in both districts every year is receiving attention.

An investigation has been made into the life history of the ciscoes of lake Ontario, including their natural habitat, food, growth, etc. The advisability of introducing cisco into the waters of Jasper Park as food for the trout, as well as the effect of different temperatures and salinity on the development of their eggs, has received attention.

An investigation is being made into the life-history of whitefish, including a determination of the stage or stages at which greatest mortality occurs; extent and cause of said mortality, their habitat, food, enemies, competitors, and the importance of artificial propagation in maintaining such fisheries, and the best methods of carrying on such propagation. Some feeding and marking of whitefish fry has also been done.

An investigation into the life history of Atlantic salmon, including their food, enemies, competitors, etc., is under way.

The prospects for success and the advisability of attempting to establish Atlantic salmon in selected streams in British Columbia is receiving attention.

An investigation into the life-history of the shad, including artificial propagation and natural reproduction has been going on for several years.

An investigation into the life history of the smelt of the Atlantic, including natural reproduction, has been going on for several years. Their value as food for other fish has been considered.

An investigation into the life history of the trout of British Columbia, including size, relative growth, colouration, racial difference, etc., is being continued in the form of a detailed study of the Kamloops trout, with a view to the development of a fish cultural policy for that species.

An investigation into the life-history of eastern speckled trout, including a determination of the relative value of artificial propagation and natural reproduction, their food, competitors, enemies, etc., has been going on for several years. The best and most economical age at which to distribute the hatchery output of this species is receiving attention.

An investigation into the life-history of pickerel in the Prairie Provinces, with particular reference to lake Manitoba, is going on.

An investigation into the life-history of the oysters of the Atlantic and Pacific coasts, including the effects of temperature, salinity, food, habitat, etc., is under way.

An investigation into the life-history of the lobster, including its breeding, size, abundance, etc., has been going on for several years.

Considerable progress has been made in an investigation of alkaline lakes in the Prairie Provinces, with a view to having them produce an annual crop of food fish, including experiments in the fertilizing and hatching of eggs in these alkaline waters to determine the margin of safety and the possible results that may be expected from natural reproduction in such waters.

Biological surveys have been made or are in progress of the waters of the Jasper and of the Prince Albert National Parks, Manitou lake, Quill lakes, etc. Biological surveys of typical classes of lakes or of lakes typical of certain districts are undertaken from time to time.

Investigations are under way to determine the relative value of various foods for both adults and fry, including the determination of a ration to improve the general quality of the eggs produced by trout in their second year; to promote the production of natural trout food (for fry and adult fish) in hatchery ponds by fertilization, aquatic vegetation, etc. Aquatic vegetation with its attached insect life is being introduced into the waters of Jasper Park with a view to increasing the food supply for fish in these waters.

The cultural possibilities of the amphipod gammarus in ponds to serve as fish food is receiving attention.

Diseases and parasites of fish and fish eggs, and a study of the physical and other conditions that may lower the vitality and pave the way for disease, with a view to removing the cause and preventing a recurrence, are receiving attention.

Courses of instruction in such subjects as chemistry, physics, limnology, etc., have been given the hatchery officers in the Maritime Provinces. Such courses are being continued in the east and are also being extended to British Columbia.

All the space desired in any or all of the hatcheries throughout the country is available for experimental work to the Biological Board and its sub-committee on fish culture. The Cultus Lake hatchery, British Columbia, is given over entirely to the sockeye salmon investigations.

FREE TRANSPORTATION

The Canadian National Railway, Canadian Pacific Railway, Dominion Atlantic Railway, Pacific Great Eastern Railway, Esquimalt and Nanaimo Railway, Kettle Valley Railway, and the Cumberland Railway and Coal Com-

pany continued their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants. The extent of this co-operation is indicated in the following summary:—

Railways	Total mileage on trip passes	Number of passages	Mileage baggage car permit			Number cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	19,222	180	10,555	13,127	23,682	876	869	1,745	181
C.P.R.....	17,524	118	9,516	10,363	19,879	559	564	1,123	136
D.A.R.....	2,366	31	1,407	1,407	2,814	123	123	246	37
E. & N.R.....	672	12	343	343	686	41	41	82	12
K.V.R.....	296	1	296		296	3		3	1
P.G.E.R.....	178	4	89	89	178	6	6	12	4
	40,258	346	22,206	25,329	47,535	1,608	1,603	3,211	371

NOTE.—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one-way passage for cases or cans, either by permit, special authority or free transportation without a permit form.

Gratifying reports regarding the results that are apparent from the distribution of hatchery products continue to accumulate from all districts where fish cultural operations are carried on. In many districts local organizations, such as Boards of Trade, Angling and Protective Associations, Service Clubs, as well as private individuals, have provided transportation and otherwise assisted in distribution work. In a few instances the necessary facilities were provided, and allotments of eggs and fry that were made by the department were hatched, retained and fed for several months at the expense of the local organizations, but under the general direction and supervision of the nearest fish cultural officer.

The Causapscaal Fishing Club courteously agreed to the capture of parent salmon for hatchery purposes in their preserves in 1927, when 115 parent fish were secured, and a similar courtesy was extended in 1928, when 152 fish, yielding over 583,000 eggs, were secured. Operations were carried on under the personal direction of Superintendent Mowat, of the Restigouche hatchery, where the eggs were laid down.

The Restigouche Riparian Association placed its power boat and crew at the disposal of the department for collecting parent salmon from the fishing stands and transferring them to the salmon retaining pond at New Mills, New Brunswick.

The Armstrong Independent Fisheries Limited co-operated in making distributions to northern lake Winnipegosis by providing their tug *Armenon* and part crew—the balance of the crew being drawn from the hatchery employees. After the fry were distributed the hatchery staff assisted the company to place out the channel buoys.

The officials and employees of other federal departments, provincial officers, the officers and crews of fisheries patrol and protection boats, have been most cordial in their co-operation in all instances where they could be of assistance. The Research Committee of the Biological Board gave prompt and courteous consideration to all problems and difficulties that were referred to them. All of this assistance and co-operation is gratefully acknowledged.

Various exchanges of eggs were made, particulars of which are given elsewhere in this report, and kamloops and cutthroat trout eggs were supplied the Tokyo Angling and Country Club, of Tokyo, Japan. The club reports that these eggs reached them in splendid condition, with a loss of only 4 per cent.

The department is most fortunate in having in its employ a staff of efficient fish cultural officers who are most conscientious in the discharge of

their duties. Only one exception to this general condition has occurred in recent years, and the delinquent suffered a well-deserved suspension without pay for six months, and was demoted as superintendent and transferred to another district with the rank of a hatchery assistant. On the other hand, several permanent appointments and well-merited promotions were made within the service.

The department participated with assortments of hatchery products and fish indigenous to the respective districts in exhibits for portraying our natural resources. An exhibit of seven species of fish, ranging from six months to six years of age, and including black bass, rainbow, brown, speckled, loch leven and hybrid trout and Atlantic salmon, from the St. John hatchery was made at the St. John exhibition in September. A similar exhibit, comprising salmon trout, cutthroat, speckled, rainbow and brown albino trout, with preserved specimens, was made from the Banff hatchery to the Calgary exhibition in July. A comprehensive exhibit of fish indigenous to the district was made at the Edmonton exhibition by the Supervisor of Fisheries, and a similar exhibit was made at the Nelson fair from the Nelson hatchery. Cutthroat yearlings and speckled trout fingerlings from the Cowichan hatchery were displayed at the New Westminster exhibition, and kamloops trout, speckled trout and spring salmon were supplied to Hastings Park aquarium in Vancouver.

From the 1927 collection exchanges of eyed Atlantic salmon eggs were made with the United States Bureau of Fisheries, the State of New Hampshire and the Trout Brook Company of Hudson, Wisconsin, for loch leven, brown, rainbow and cutthroat trout eggs. Exchanges of Atlantic salmon eggs collected in 1928 with the United States Bureau of Fisheries and with the Bureau of Fish Culture, California, have been arranged.

The total collection of speckled trout eggs from wild fish was nearly double that of last year.

The efforts that have been made for several years by the Bedford hatchery staff were discontinued as it did not appear that the results that might be attained were likely to be commensurate with the trouble and expenditure involved; fair increases were made by the staffs of the Margaree and Nelson hatcheries, and the Kelly's Pond and Cowichan hatcheries more than doubled their collections of the previous year. A satisfactory collection was made from the pond fish at the newly established hatchery at Florenceville, but the yield from the St. John hatchery ponds was considerably smaller than it was in 1927. Detailed record of the numbers of speckled trout eggs that were collected in 1928, and the disposal that was made of them up to December 31 of that year are given in a subsequent statement.

In addition to the local collections six million one hundred and forty-three thousand six hundred and eighty-five speckled trout eggs were purchased. Two hundred and fifty thousand were allotted to Jasper park hatchery, Alberta, and the balance to Maritime hatcheries as detailed in a later statement.

MARITIME PROVINCES, EASTERN DIVISION
District Inspector of Hatcheries, James Catt

While small increases over the preceding year were made in the numbers of Atlantic salmon eggs collected at the New Mills and the St. John retaining ponds where the parent fish are purchased from the early run commercial catch, the late summer and autumn runs at several other collecting points were below the average, and the collections at these places were not as large as they have been in recent years. The total collection of Atlantic salmon eggs from all sources was consequently over seven million smaller than it was in 1927.

Details of the numbers of such eggs collected and the disposal that was made of them up to December 31, 1928, are given in a subsequent statement.

The collection of landlocked or seabago salmon eggs was continued in a more or less experimental way in the Chamcook lakes, N.B., to determine, so far as may be feasible, before incurring the cost of a permanent camp, the number of such eggs that may be expected from this source in an average season. Slightly over 168,000 eggs were taken.

ANTIGONISH HATCHERY

Geo. Sutherland, Superintendent

The new salmon and trout hatchery described elsewhere in this report was completed late in the season and placed in charge of Mr. George Sutherland, who has had a long experience in the Miramichi hatchery, New Brunswick, as well as experience in fish cultural work in other parts of the Maritime Provinces. Operations were scarcely under way at the close of the year, but the plant and equipment was complete and had received four hundred and twenty-two thousand salmon eggs from River Philip, four hundred and sixty thousand nine hundred and sixty speckled trout eggs from the American Fish Culture Company, and eight hundred speckled trout fingerlings from the best stock at the St. John hatchery, as the nucleus of a brood stock at the new establishment.

BEDFORD HATCHERY

Geo. Heatley, Superintendent

The supply of Atlantic salmon eggs from the collection of 1927 was secured for this establishment from the Miramichi pond, but the supply of Atlantic salmon eggs for 1928, viz., two million thirty-eight thousand five hundred, was secured from the camp that was recently opened at River Philip, and the supply of speckled trout eggs, viz., one million four hundred and seventy-three thousand two hundred, was secured from commercial firms as it was evident from the experience of recent years that the collection of such eggs from wild fish in that district was not commensurate with the time and expenditure involved.

Assistant Butler of this establishment was in charge of the collection of landlocked salmon eggs in Chamcook lakes, New Brunswick, where one hundred and sixty-eight thousand and four eggs were secured for incubation in St. John hatchery. A new ten-inch, wire-wound wooden pipe was laid from the canal to the immediate vicinity of the hatchery, from which point an eight-inch branch leads to the hatchery troughs and another to the outside rearing tanks. The screened area at the intake of the supply pipe and the well were decked over, thus adding to the security of the water supply.

Salmon and trout fry, as required, were supplied by this hatchery to Dalhousie University and the Biological Station at Halifax. Space was also allotted in the hatchery to members of the Biological Board for carrying on independent research work.

Practically all of the output of this hatchery, except a few eggs and fry for experimental purposes, was fed and distributed in the advanced fry and fingerling stages. One million, five hundred and fifty-seven thousand one hundred and twenty-one Atlantic salmon and eight hundred and twenty-four thousand five hundred and fifty speckled trout were planted out.

MARGAREE HATCHERY

L. J. Burton, Superintendent

In addition to the ninety-one thousand one hundred and twenty-two speckled trout eggs obtained from the hatchery ponds, an effort was for the first time made to collect such eggs in the Pleasant bay and Pollets river dis-

tricts. Weather conditions throughout were very unfavourable, and while the number of eggs obtained, one hundred and eleven thousand seven hundred and thirty-five, was not large, prospects are considered sufficiently promising to warrant a further effort next year. In all, two hundred and two thousand eight hundred and fifty-seven speckled trout eggs were taken. Two million five hundred and forty-nine thousand seven hundred and sixty-six Atlantic salmon eggs were procured from the Margaree salmon pond and points in the Margaree river.

A new ten-inch, wire-wound wooden pipe line was laid, as the capacity of the old iron pipe had become considerably lessened through corrosion. A new dam was also built at the intake and other necessary repairs were made at this establishment. The greater part of the output was fed and distributed in the advanced fry and fingerling stages. Two million two hundred and forty thousand Atlantic salmon and one hundred and seven thousand three hundred and twenty-eight speckled trout were planted out.

The Lindloff hatchery, a subsidiary to Margaree, was operated in the usual manner and received its supply of salmon eggs, eight hundred thousand, from Bedford. From this number seven hundred and forty-six thousand were hatched out and distributed in local waters.

MARGAREE SALMON RETAINING POND

J. P. Chiasson, Superintendent

Parent salmon are purchased from a number of commercial fishermen who previously operated in what is known as the Inside harbour, and who have pooled their interests and operate one large, small-mesh trap suitable for taking salmon for hatchery purposes, instead of several smaller traps that were previously operated at various points by these men. On September 8 the trap was put in commission to fish five days a week. On the other two days of the week the leads were raised to permit the free ascent of the salmon to the angling waters above. As it became apparent that the number of salmon that were being taken would not be sufficient to meet requirements, the trap was fished continuously throughout the week, beginning September 26. From September 15 to October 20, three hundred and seventy-two salmon were impounded, but on October 21 a severe freshet carried out the trap and damaged the twine. It was reset on October 25, but a second freshet immediately carried away and damaged it to such an extent that it could not be repaired so as to resume operations. An effort was therefore made to augment the number of salmon at that time in the pond by sweeping the up-river pools, but the high water nullified such operations.

The fish in the pond were stripped between November 13 and December 3, and yielded two million five hundred and fifteen thousand eggs, all of which were laid down in the Margaree hatchery in splendid condition. The salmon did extremely well in retention, and there was a loss of only one fish throughout the whole of the season.

MIDDLETON HATCHERY

H. V. Gates, Superintendent

This establishment handles Atlantic salmon and speckled trout. The salmon eggs, one million three hundred and thirty-five thousand five hundred and thirty-seven in number, were secured from the Miramichi pond, and the trout eggs, six hundred thousand, from Paradise Brook Trout Company. In the autumn of 1927 two thousand speckled trout fingerlings were liberated in the water supply pond of the hatchery. In August and September of 1928 the pond was drained and thirteen hundred yearlings were obtained. No artificial food was given to these fingerlings while they were in the pond.

The superintendent reports a small run of Atlantic salmon in the western portion of the province in 1928, probably due to the very dry season, but as compared with this apparent scarcity, the Mersey river carried one of the heaviest runs that it has known for a long time. The Mersey is, however, one of the largest rivers in the western part of the province, and the water is controlled by storage dams, thus maintaining a fairly uniform flow throughout the season. The fishery overseer for the district reports that a large percentage of the salmon taken in the Mersey in 1928 are somewhat different in shape from those that have been caught in other years, and is consequently of the opinion that the comparatively large run that has been established is the result of the distribution of fry from the Middleton hatchery, which receives its quota of salmon eggs from the Miramichi river.

The distributions from Middleton amounted to one million seven hundred and forty-nine thousand Atlantic salmon, and four hundred and fifty thousand four hundred and sixty-seven speckled trout.

RIVER PHILIP EGG-COLLECTING CAMP

George Heatley and George Sutherland, Officers in Charge

An egg-collecting camp was opened in a more or less experimental way in the vicinity of the power plant on river Philip, primarily for the purpose of securing Atlantic salmon eggs for the new hatchery at Antigonish. A good run of salmon, particularly in the late summer and early autumn, has in recent years developed in this stream, and prospects for collection appear more favourable there than in any other stream in eastern Nova Scotia. Water conditions were not as favourable as they usually are, but a total of six hundred and fifteen fish were secured, yielding two million four hundred and sixty thousand five hundred eggs, which were laid down as follows: Antigonish hatchery, four hundred and twenty-two thousand; Bedford hatchery, two million thirty-eight thousand five hundred.

WINDSOR HATCHERY

F. M. Millett, Superintendent

The Windsor hatchery was not in active operation because drainage from certain gypsum quarries of the district finds its way, under certain conditions, into the hatchery supply and has been found to be fatal to eggs and fry. As the pumping from the quarries in question was discontinued early in the season, it was hoped that the injurious matter would have been washed away or have become neutralized. A few eggs were, therefore, placed in the hatchery, but during a freshet the injurious element above referred to was found to be nearly as fatal as it had been during the previous year.

YARMOUTH HATCHERY

H. V. Gates, Acting Superintendent

The new salmon and trout hatchery in Yarmouth county, which is described elsewhere in this report, was completed and equipped in the autumn of 1928. No collection of eggs was made in the district, but eight hundred speckled trout fingerlings were received from the St. John hatchery as the nucleus of a brood stock. Four hundred and ninety thousand three hundred speckled trout eggs, purchased from the American Fish Culture Company, were laid down. Atlantic salmon and additional speckled trout eggs have been arranged for.

FLORENCEVILLE HATCHERY

K. G. Shillington, Superintendent

This establishment, located on White Marsh creek about one mile from Florenceville, N.B., on the westerly side of the St. John river, was opened in the

autumn of 1927, and will cover in its distribution area the central portion of the province along the St. John valley and the upper portions of the southwest Miramichi, that cannot be readily reached from other hatcheries. It is fully equipped and up-to-date in all particulars, being provided with a series of ponds which may be extended as development renders necessary. The salmon eggs were obtained as follows: St. John and Miramichi each supplied one million eggs early in the year, and St. John supplied two million five hundred and seventy-seven thousand nine hundred and sixty during the autumn. A small but satisfactory collection of three hundred and four thousand and eighty-eight speckled trout eggs was obtained from the hatchery ponds but the greater part of this supply was purchased from commercial firms—one million from Paradise Brook Trout Company early in the year and four hundred and fifty-two thousand nine hundred and eighty-five from American Fish Culture Company during the autumn. One thousand and fifty speckled trout brood stock was also supplied from St. John early in the season. Florenceville distributed during 1928 one million six hundred and eighty-eight thousand three hundred and forty-six Atlantic salmon and five hundred and seventy-seven thousand and fifty speckled trout.

GRAND FALLS HATCHERY

Paul Parent, Superintendent

Grand Falls hatchery propagates Atlantic salmon and speckled trout. No local collections are carried on and the supplies of eggs are annually received from other sources.

Early in the year it received seven hundred thousand Atlantic salmon eggs from Miramichi hatchery and during the autumn three million six hundred and forty-three thousand one hundred and twenty from St. John pond. It received nine hundred thousand speckled trout, by purchase, early in the season from Paradise Brook Trout Co. The following distributions were made: Atlantic salmon, two million six hundred and twenty-four thousand six hundred and fifty; speckled trout, seven hundred and eighty-three thousand six hundred and twelve.

The Tobique hatchery is subsidiary to Grand Falls, and is utilized to facilitate the distribution of Atlantic salmon in that stream, which has become the most important spawning tributary of the St. John river system. This hatchery received seven hundred thousand Atlantic salmon eggs from Grand Falls hatchery (Miramichi eggs), of which six hundred and sixty-five thousand hatched out and were distributed.

MIRAMICHI HATCHERY

Frank Burgess, Superintendent

The superintendent of the Miramichi hatchery is responsible for the operation of the Miramichi hatchery and the Miramichi salmon retaining pond. The parent salmon are purchased by tender and contract from the late summer and early autumn run, which usually occurs in large numbers in the Miramichi and its tributaries. In 1928 commercial fishing for salmon was comparatively poor for both the drifters in Miramichi bay and the trap-net fishermen. This condition continued into the late summer and the usual number of fish was not secured for the retaining pond. One thousand two hundred and ninety-one were, however, obtained from the successful contractor between September 12 and October 23. This number was supplemented by two hundred and eleven that were seined by the hatchery staff in the "Big Pool" in the Northwest Miramichi. The eggs secured were laid down as follows: Middleton hatchery, one million three hundred and thirty-five thousand five hundred and thirty-seven; Miramichi hatchery, six million one hundred and thirty-five thousand one hundred

and eighty-six. Miramichi during the year shipped out the following Atlantic salmon eggs: Nipisiguit hatchery, one hundred and fifty thousand; Florenceville hatchery, one million; Grand Falls hatchery, seven hundred thousand; Kelly's Pond hatchery, four hundred and fifty thousand; Cowichan Lake hatchery and Alberni district, one million; Trout Brook Co., five hundred thousand; New Hampshire state, one million; United States Bureau of Fisheries, one million. The distribution from Miramichi during 1928 was four million forty-one thousand one hundred and twenty Atlantic salmon, all planted out in the fingerling stage, except for one hundred thousand eyed eggs that went to British Columbia.

NEW MILLS SALMON RETAINING POND

Wm. White, Superintendent

The salmon for the New Mills pond are purchased from commercial fishermen of the vicinity. Most of the fish impounded are from the early run. In 1928, out of a total of 360 fish, 321 were secured during the month of June. Stripping operations covered the period between October 23 and November 12, a total of one million seven hundred and twenty-three thousand two hundred and thirty-five eggs being secured, all of which were laid down in the Restigouche hatchery. A loss of only four fish occurred during the season, although most of the fish were in the pond from June until the latter part of October.

RESTIGOUCHE (FLATLANDS) HATCHERY

W. A. Mowat, Superintendent

The commercial catches in the upper end of the bay Chaleur and the angling in the Restigouche and its tributaries, as a whole, was not up to the average of recent years. The falling off in the commercial fishery is attributed by many persons to porpoises in unusual numbers in the bay. Water conditions in the river were not favourable for angling. The water in the river was at a low stage comparatively early in June and continued in this condition until late September, when a sudden rise occurred. By the middle of October salmon are reported as having been quite plentiful on all the spawning grounds of the main river and in the various tributaries. The Causapscaal Fishing Club, controlling a large portion of the Matapedia river, kindly agreed to the department securing parent salmon in their area, as it did during the previous year. Salmon were found to be rather scarce at the beginning of operations, but became plentiful as the work proceeded. A total of one hundred and fifty-two were taken by seining which yielded five hundred and eighty-three thousand three hundred eggs, all of which were laid down in the Restigouche hatchery. This collection was supplemented by receipt of one million seven hundred and twenty-three thousand two hundred and thirty-five salmon eggs from New Mills pond. The local distribution for 1928 was made largely in the advanced fry and fingerling stages. The great bulk of the output at this establishment is distributed by scow. The fry are transferred by hand from the hatchery troughs and tanks to the towing scow or pontoon which is moored in the river in front of the hatchery. The scow is then towed to the upper reaches of the river and the fry are thus liberated as desired and over an extremely wide area. In all, one million nine hundred and twenty-three thousand three hundred and fifty salmon were planted out.

The Nipisiguit hatchery is a subsidiary of the Restigouche hatchery. No effort was made to capture parent salmon or collect eggs in the Nipisiguit in 1928, as there was an unusually poor showing of fish in the river. It, therefore, received its supply of eggs in the eyed stage from the Restigouche hatchery. The 1928 quota, five hundred and fifteen thousand six hundred and fifty, was

obtained as follows: From New Mills pond via Restigouche hatchery, three hundred and sixty-five thousand six hundred and fifty; from Miramichi pond via Miramichi hatchery, one hundred and fifty thousand. The distribution for 1928 was four hundred and forty-seven thousand three hundred and seventy-four.

ST. JOHN HATCHERY

J. D. Nichol, Superintendent

The St. John hatchery has a larger and more extensive system of ponds than any other hatchery operated by the federal Government, and handles a greater variety of fish, including Atlantic salmon, land locked or sebago salmon, brown, loch leven, rainbow and speckled trout. Several experiments in selective breeding, feeding different quantities and kinds of food in different rations and combinations are carried on at this establishment, which also supplies the St. Andrews Biological Station with various allotments of eggs and fry for experimental purposes. This hatchery supplies more than its own requirements of speckled trout eggs, and is the only one in the eastern division that produces the eggs of other species from domesticated brood stock. The greater part of the output is distributed in older than the advanced fry stage. The nucleus of the brood stocks of speckled trout at Florenceville, Antigonish, and Yarmouth hatcheries have been supplied from St. John. It also acts as a clearing house for most of the shipments of eggs that are made to and from the Maritime Provinces. During 1928 exhibits of seven species were made at the St. John exhibition, St. John, N.B. During the calendar year the following collection of eggs were made: speckled trout—one million four hundred and sixty-six thousand one hundred and eight; Landlocked salmon—one hundred and sixty-eight thousand and four; Brown trout—one hundred and fifty thousand two hundred and seventy-two; Hybrid brown trout—ten thousand five hundred; Loch leven trout—fifty-eight thousand two hundred and twenty-two; Rainbow trout—three thousand four hundred and twenty. Out of the shipments of one million eight hundred and ninety-three thousand six hundred and eighty-five speckled trout eyed eggs purchased from the American Fish Culture Company and received in December, 1928, sixteen thousand two hundred and forty from the different shipments were held at St. John for comparative purposes. One million eighteen thousand five hundred and eighty Atlantic salmon eggs were laid down from the salmon pond. From the eggs on hand early in 1928, one million Atlantic salmon were shipped to Florenceville hatchery. St. John supplied the following speckled trout as a nucleus for brood stocks: Florenceville—one thousand and fifty; Yarmouth—eight hundred; Antigonish—eight hundred. St. John made the following distributions: Atlantic salmon—five hundred and sixty-five thousand seven hundred and forty-eight; Brown trout—three hundred and eight thousand eight hundred and eighty-nine; Landlocked salmon—ninety-eight thousand three hundred and eight; Loch leven trout—sixty-four thousand two hundred and thirteen; Rainbow trout—four thousand eight hundred and seventy-four; Speckled trout—seven hundred and twelve thousand six hundred and thirty-four—a total distribution of one million seven hundred and fifty-four thousand six hundred and sixty-six.

ST. JOHN SALMON RETAINING POND

J. D. Nichol and K. G. Shillington

J. D. Nichol is responsible for the operations of this establishment, but on account of the volume and importance of operations at the St. John hatchery, Mr. Shillington was in charge of stripping operations at the pond during 1928.

The parent fish are purchased from the early run commercial catch. One thousand four hundred and forty-nine were secured from this source between

May 31 and August 30. Stripping operations extended from October 24 to November 9, yielding a total of seven million two hundred and thirty-nine thousand six hundred and sixty eggs, which were laid down as follows: Florenceville hatchery—two million five hundred and seventy-seven thousand nine hundred and sixty; Grand Falls hatchery—three million six hundred and forty-three thousand one hundred and twenty; St. John hatchery—one million eighteen thousand five hundred and eighty. The run of salmon in the St. John harbour was not as large as was expected and very few were taken in the commercial nets and weirs in the latter part of the season. The area of the pond was nearly doubled by moving the upper fence upstream and a large amount of gravel was removed from the mouth of Little river in which the pond was constructed so as to provide a freer circulation of water, a quicker run-off with the ebb of the tide, and also to enable the effect of the incoming tides to be more quickly felt in the pond.

KELLY'S POND HATCHERY

F. C. Hayley, Superintendent

Collections of Atlantic salmon, speckled trout, and rainbow trout eggs were made from this hatchery. The salmon eggs were collected in the Morell river, where the parent fish were captured by seining between October 10 and November 22. Seven hundred and eighteen thousand five hundred eggs—more than double the collection of 1927—were secured, all of which were laid down in Kelly's Pond hatchery. Early in 1928 four hundred and fifty thousand Atlantic salmon eyed eggs were received from the Miramichi hatchery. Three hundred and fifty-seven thousand three hundred and thirty-six speckled trout eggs were collected from the hatchery water supply pond and from six other ponds in the province. Until 1928 the owners or proprietors of mill ponds were paid at the rate of ten cents each for all fish of ten inches and over in length that were placed at the disposal of the hatchery officers in a healthy, vigorous condition. These fish were stripped and liberated by the hatchery employees. In 1928, however, the owners of the ponds in question were paid at the rate of one dollar per thousand for such eggs as reached the eyed stage. The necessary retaining crates, dip-nets, etc., were furnished by the department. In addition, five hundred thousand speckled trout purchased eggs were secured early in 1928 from Paradise Brook Trout Company. Fourteen thousand one hundred and ten rainbow trout eggs were secured in Pisquid lake, which received its first allotment of this species in 1924. This is the only water in the province where this species is found. Distributions made during 1928 were as follows: Atlantic salmon—six hundred and eighteen thousand six hundred and fifty-three; Rainbow trout—eleven thousand four hundred and nine; Speckled trout—four hundred and thirteen thousand three hundred and fifty-five—a total of one million forty-three thousand four hundred and seventeen.

PRAIRIE PROVINCES—CENTRAL DIVISION

District Inspector of Hatcheries, S. J. Walker

The collection of whitefish eggs in this division was over seventy-one million larger than it was in 1927. Increases over the previous year's collection of approximately twenty-seven million were made in both lake Winnipegosis and lake Winnipeg. Experimental fishing for hatchery purposes was continued in the Jackfish-Murray lakes, Saskatchewan, where an increase of over one million eggs was made. Over eighteen million eggs were collected by the staff of the new hatchery that was opened in the autumn of 1928 on Lesser Slave lake. All previous records in the collection of pickerel eggs in this district were exceeded,

principally by the success that was attained in Swan creek, lake Manitoba, where experimental fishing was carried on with a view to determining the number of eggs that might be expected at this point. Over one hundred and eighty-seven million were secured, and this success, coupled with the results of previous years, led to the construction of a pickerel hatchery at this point, to be ready for operation in the spring of 1929. Test fishing for pickerel was also carried on in the Jackfish-Murray lakes, where over nineteen million eggs were secured and laid down in the Fort Qu'Appelle hatchery. The collection in lake Winnipeg was slightly smaller, while that in Sioux lake was slightly larger than in the previous year.

Commercial fishermen, fish dealers, boards of trade, and others interested in the fisheries of lake Winnipeg are petitioning for the construction of a hatchery to replace the Dauphin river establishment that was burned a few years ago. As supplies of eggs, in addition to those that are at present available, would be necessary for such a hatchery, test fishing for whitefish eggs was carried on at Pigeon bay and Berens river, on the easterly shore of lake Winnipeg.

Details as the numbers of whitefish and pickerel eggs collected in 1928 and the disposal that was made of them up to December 31 of that year are given in a subsequent statement.

GULL HARBOUR (LAKE WINNIPEG) HATCHERY

C. P. Paulson, Superintendent

Approximately seventy per cent of the whitefish fry that resulted from the collection of 1927 were distributed by scow and motorboat in the general vicinity of Big island. Over sixteen million eggs were placed in the hatching battery on the C.G.S. *Bradbury* and taken to Berens river, one hundred miles north of the hatchery. The resultant fry were given, as they hatched, a widespread distribution in this area. The 1928 supply of whitefish eggs were collected from pound nets operated by the hatchery staff at the mouth of the Little Saskatchewan or Dauphin river. The leads of the net which close the river were raised from six o'clock Saturday evening until six o'clock on the Sunday following, throughout the operations. The net was in commission on September 19, and was pulled out on October 27. Fishing was generally poor in September, but improved during the early part of October. A total of twenty-two thousand three hundred and fourteen whitefish was taken, of which three thousand seven hundred and eighty male fish taken in the early part of the season were liberated above the net as they were caught. The first eggs were obtained on October 19 and the total collection amounted to ninety-six million three hundred and seventy-five thousand. All the eggs from Dauphin river camp were laid down in Gull Harbour hatchery. As the fish in the retainers were not ripening in a satisfactory manner, the operations were brought to a close on November 5, with the liberation of eleven thousand eight hundred and eighty-five fish. On October 14 some experimental fishing for hatchery purposes was done in Pigeon bay on the east shore of the lake. The most promising locations in Pigeon bay and Berens river districts were tested, but the results were far from encouraging, the total collection amounting to three million two hundred and twenty-five thousand eggs. These eggs were fertilized and planted on the reefs near where the nets were set.

Pickerel eggs were again collected in the vicinity of the quarry, Big island. The ice was late in breaking up and fishing did not commence until May 18. The run of fish was light, possibly due to the late breaking up of the ice, but the eggs secured were generally satisfactory. Seventeen million five hundred and ten thousand eggs were taken. When it was observed that the run was over at the quarry, an effort was made at Grassy narrows but it was found that

the fish there had also left the spawning grounds. The great majority of the fry were distributed in lake Winnipeg, but two million were transferred to Selkirk and allotted to a number of the smaller lakes in the southerly part of the province. Some two thousand five hundred whitefish were marked at the Dauphin river spawning area with a view to gaining definite information regarding the movements of these fish. Gull Harbour hatchery during 1928 distributed thirteen million forty-seven thousand pickerel and fifty-eight million one hundred and five thousand whitefish.

SWAN CREEK (LAKE MANITOBA) HATCHERY

Geo. E. Butler, Acting Superintendent

Experimental fishing for hatchery purposes was carried on at Swan creek, lake Manitoba, to determine the possibilities for collecting pickerel eggs for hatchery purposes at this point. Twelve thousand and thirty-eight pickerel were taken, which yielded one hundred and eighty-seven million three hundred and forty thousand eggs. These eggs were fertilized, waterhardened and distributed on the spawning grounds of the district. In view of the large collection, tenders were invited, and a pickerel hatchery constructed and equipped for operation during the spring of 1929.

WINNIPEGOSIS HATCHERY

Geo. E. Butler, Superintendent

Parent whitefish were caught in pound nets operated by the hatchery staff in Waterhen river. They were transferred to the lagoon at the hatchery where they were retained until they had ripened. The nets were set on September 14 and continued until October 27. Fourteen thousand five hundred and thirty fish were caught which yielded one hundred and twenty-one million eggs. Ninety-six million of these were laid down in the Winnipegosis hatchery and twenty-five million transferred to Fort Qu'Appelle hatchery. Weather conditions were favourable. The collection made was considerably larger than those of recent years, and the eggs were of good quality. Improved fishing conditions in the south end of the lake are indicated by the increase in the number of fishermen who are now operating there.

A number of whitefish fry were marked at this hatchery by the removal of one pectoral fin, by an employee of the Biological Board, and some two thousand five hundred parent whitefish were marked in the autumn by the hatchery staff, with a view to gaining information regarding the movements of these fish.

Some experimental fishing for pickerel eggs was made in Valley river, lake Dauphin. Large numbers of rough fish were caught, but the pickerel operations were not sufficiently successful to warrant continuing them another season, as only three hundred and forty thousand eggs were taken.

Distributions made during 1928 amounted to three hundred and forty thousand pickerel and fifty-one million ninety-nine thousand and twenty-six whitefish.

Two rooms were fitted up for the hatchery as an addition to the sleeping quarters for the staff, and other minor repairs were effected.

FORT QU'APPELLE HATCHERY

W. C. Mapes, Superintendent

During 1928 the whitefish floor tank and one side of the whitefish battery were removed and replaced by one single tier battery and twenty-four trout troughs each nine feet long in four sets of six troughs each. The troughs in the two upper sets overflow into the others. Two fry tanks ten by twelve

each were built outside the hatchery and provided with a removable roof. This change in equipment was primarily for the purpose of facilitating the hatching of trout for stocking waters in the province which heretofore have been stocked by transfer of fry from the hatchery at Banff.

A collection of pickerel eggs was carried on at Arnolds point, Sioux lake, where ten million four hundred and fifty-five thousand eggs were obtained. Unfavourable weather conditions prevailed, and the lateness of the season delayed the setting of the nets. Drifting ice necessitated constant changing of the nets from place to place, and also prevented their being operated at the most favourable points in the river. Nineteen million three hundred and eighty thousand pickerel eggs were received also from Cochin, Saskatchewan. Twenty-five million whitefish eggs were secured from the Winnipegosis hatchery and four million two hundred thousand from Jackfish-Murray lakes near Cochin, Saskatchewan, but no efforts were made to collect in the Fishing Lakes near the hatchery as the returns of the previous year did not warrant the expenditure. In addition to the lakes that were stocked with hatchery fry, six different bodies of water received allotments of fish aggregating seven thousand five hundred perch yearlings and seven hundred minnows by transfer from other bodies of water. One hundred and fifty-two thousand one hundred Loch Leven trout eggs were received in an exchange with the United States Bureau of Fisheries. These were incubated and the resultant fry will be distributed in waters in the Cypress hills district. Distributions made during the year amounted to thirty-eight thousand Brown trout, nineteen million five hundred and seventy thousand pickerel, fifteen million one hundred and ninety-nine thousand whitefish—a total of thirty-four million eight hundred and seven thousand.

Cochin Egg Collecting Station

Experimental fishing was carried on, under the direction of Assistant O. Bright, of the Fort Qu'Appelle hatchery, in the creek between Jackfish and Murray lakes in the spring and autumn of 1928, with a view to ascertaining the numbers of pickerel and whitefish eggs that are obtainable at this point for hatchery purposes. Four thousand and eighty pickerel were taken between April 11 and May 14, of which four hundred and fourteen females were stripped, yielding nineteen million three hundred and eighty thousand eggs which were laid down in the Fort Qu'Appelle hatchery. Similar operations were conducted in the autumn, and twenty-two thousand six hundred and ninety-nine whitefish were caught between September 27 and November 17. The catch was smaller than that of the previous year, and is attributed to the prevalence of northwest winds which choked up the creek where it enters Jackfish lake. Conditions similar to those met with in the previous year were again encountered, and extremely cold weather occurred before the fish that were held in retention had ripened. Notwithstanding the large number captured only one hundred and thirty-seven females had ripened and were stripped before climatic conditions, with heavy frosts, made it necessary to liberate the remainder. The eggs taken—four million two hundred thousand—were laid down at Fort Qu'Appelle.

BANFF HATCHERY

J. E. Martin, Superintendent

The Banff hatchery covers in its distribution area an extremely large territory, extending from Jasper Park at Edmonton on the north to the international boundary on the south, including a number of foothill streams in this territory. It also handles more than the average number of species, which in 1928 included cutthroat, rainbow, brown, Loch Leven, and salmon trout. A large percentage of this output is distributed in the fingerling stage, and the distribution extended from May 20 until September 22.

The rainbow, brown, Loch Leven, and cutthroat trout eggs are secured by purchase or exchange, and not by local collections, except for a few rainbow taken from the hatchery pond. The eggs laid down were secured as follows: Rainbow trout, three thousand eight hundred and twenty-five from the hatchery ponds, two hundred and nineteen thousand from Trout Brook Company, four hundred and eighty-three thousand six hundred from state of New Hampshire; Salmon trout—one hundred and ninety-seven thousand two hundred from Cold lake, Alberta; Cutthroat trout—two hundred thousand from S. S. Drew, Troy, Montana; nine hundred and sixty-two thousand eight hundred from United States Bureau of Fisheries, five hundred and thirty-seven thousand six hundred from state of New Hampshire; Brown trout—one hundred and fifty-five thousand two hundred and thirty from Trout Brook Company; Loch Leven trout—three hundred and fifty-two thousand two hundred and fifty-six from United States Bureau of Fisheries. The hatchery water supply has, up to the present, been obtained from the town's service, which is of uniformly low temperature. As this low temperature, on occasions, unduly delays hatching and development, a creek in the vicinity was tapped and connected by a pipe line with the hatchery, which gives a much greater range of temperature, and it is hoped will enable the earlier eggs to be advanced and the fry distributed, thus affording a longer distribution season and more room for the later varieties. Distributions made during the year amounted to two million two hundred and eighty thousand two hundred and forty-two by species as follows: Brown trout—one hundred and thirty thousand and fourteen; Cutthroat trout—one million one hundred and ten thousand and thirteen; Loch Leven trout—four hundred and seventy-four thousand seven hundred; Rainbow trout—five hundred and sixty-five thousand five hundred and two; Salmon trout—twelve; Speckled trout—one. Exhibits of fish in various stages were made at Edmonton and Calgary exhibitions and at Pincher Creek Forest exhibit.

Spray Lakes Hatchery

The Spray Lakes hatchery is subsidiary to the Banff establishment, and is carried on under its direction. Two trap-nets are operated, one at the head of the chain of lakes and the other in the creek connecting the first and second lake. The season was backward with much snow in the hills, which delayed the run, and when the snow melted freshet conditions were induced which flooded the entire flats surrounding the trap-nets. Undoubtedly a large proportion of the trout escaped in this way at the upper net, but the collection at the lower net was not so seriously affected. The collection of three hundred and eighty-five thousand five hundred and seventy eggs, which was considerably smaller than those of recent years, was hatched and the resultant fry, three hundred and nineteen thousand six hundred and seventy, distributed at the Spray lakes.

Cold Lake Egg Collecting Station

Test fishing was carried on in Cold lake, northwest of Edmonton, under the direction of Superintendent Martin, of the Banff hatchery, for the purpose of determining the numbers of salmon trout eggs that might be expected in this lake under average conditions. After prospecting the most favourable looking locations with gill-nets, the vicinity of Murray island was selected, and stakes were driven and pound-nets set at Rinde point, about three miles east of the island. The result of these efforts was not encouraging, and it appears from the experience of the last two seasons that the spawning grounds of Cold lake are so extensive that there is no great collection of spawning fish at definite points, but that they spawn more or less over the whole of the lake. Three hundred and thirty-eight thousand eight hundred and fifty eggs of indifferent quality

were secured, but a heavy loss occurred before the remaining balance—one hundred and ninety-seven thousand two hundred—were laid down in the Banfi hatchery.

With a view to gaining some information regarding the approximate numbers of suckers and other coarse fish in Cold lake, a trap-net was operated in Medley river, one of the tributary streams, by Fishery Guardian H. Turcotte, in June. He was unable to maintain the net in position during the freshets, which brought down a large amount of debris. Thirteen thousand four hundred and sixty-seven suckers were, however, taken, and information gathered which will enable operations to be undertaken on a larger scale should such be deemed advisable.

LESSER SLAVE LAKE (CANYON CREEK) HATCHERY

H. J. Reid, Superintendent

The whitefish and pickerel hatchery at Lesser Slave lake was completed, a wharf built, equipment installed, and grounds improved, during the summer. Test fishing for pickerel was also carried on in Buffalo bay, near Grouard, at the westerly end of Lesser Slave lake. Superintendent Reid reached the village of Grouard on April 21, while the ice was still quite firm in the river and adjacent bay. As the pickerel appeared to be ascending the river under the ice a camp was established on a branch creek about fifteen miles up Heart river. The camp, with the adjoining territory, was almost immediately flooded by freshets, and operations were removed to the vicinity of Grouard. Efforts made at various places near Grouard were neutralized by freshets carrying ice and floating debris of all kinds. There were only five hundred and sixty female fish, of which two hundred and nineteen were ripe in a total catch of five thousand, six hundred and thirty. All fish taken were liberated. Test fishing, with gill-nets, was carried on from October 1 for the purpose of locating the most productive whitefish spawning grounds. As a result of this fishing one pound-net was set at Nine Mile point on October 18, and a second on the north shore about fourteen miles from the hatchery on October 25. Stormy weather prevailed, which injured the north shore net and it was removed on November 3. The Nine Mile point net was put out of commission by drift ice on November 1, and was not reset as conditions were so unfavourable. Fishing with gill-nets was continued until November 23, when an examination was made of conditions at Whitefish lake. The river between the lakes was still open, but the run of whitefish had passed. As the ice was sufficiently firm to carry, gill-net fishing was resumed in Lesser Slave lake on December 1, and the catches of the commercial fishermen at Faust were examined. The total collection of whitefish eggs, amounting to eighteen million five hundred thousand were laid down in the Lesser Slave Lake hatchery.

The installation of the equipment, including a duplex pumping plant and electric generator, was completed. A four hundred-foot wharf was built which not only includes a landing but a shelter for the boats and the pound-net pots in which the parent fish are retained. Two launches were supplied. The larger, *Utikuma* (Cree for "Big Whitefish"), has a length of forty-five feet over all, beam ten feet six inches, moulded depth four feet nine inches, draft three feet, carvel built, and is equipped with a six cylinder, four cycle, medium duty Kermath engine, of from forty to sixty-five rated horse power. This boat has accommodation for four men. The smaller boat *Utikumasis* (Cree for "Little Whitefish"), has a length of twenty-eight feet over all, beam eight feet five inches, moulded depth three feet three inches, draft fourteen inches, carvel built, and is equipped with a four cylinder, four cycle, medium duty Universal engine.

WATERTON LAKES HATCHERY

G. E. Bailey, Acting Superintendent

The new trout hatchery in the Waterton Lakes Park, southern Alberta, was completed, settling tank built, a portion of the property cleared of shrub, and fenced, and general surroundings improved. The equipment was made ready for operations, and eighty-eight thousand and fifty cutthroat trout eggs from Yellowstone Park, Wyoming, were laid down in the troughs. Of this number eighty-two thousand, eight hundred hatched and were distributed in the district.

JASPER SUB-HATCHERY

One hundred and ninety thousand, seven hundred and seventy-three eastern speckled trout were distributed in the Medicine-Maligne Lake system of Jasper Park from the subsidiary hatchery which was fitted up particularly for the introduction of the species mentioned to the system in question, which was previously barren of fish life. The two hundred and fifty thousand eggs which were secured by purchase from the Paradise Brook Trout Company were cared for by the Park's staff under the general direction of the Supervisor of Fisheries for Alberta. The fry were distributed under unusually difficult conditions by Assistant Bright, of the Fort Qu'Appelle hatchery, the necessary assistance, including trucks, pack-horses, etc., being provided by the Parks Branch.

BRITISH COLUMBIA, WESTERN DIVISION

District Inspector of Hatcheries, C. W. Harrison

The total collection of sockeye salmon eggs in the Fraser River watershed was twenty-seven million one hundred and seven thousand larger than that of 1927, and nearly twenty-five million larger than the collection that was made in 1924, the corresponding year of the four-year cycle which obtains in the Fraser river.

The total collection of all species in the watershed was seventy-three million two hundred and thirty thousand eight hundred, as compared with forty-nine million three hundred and forty-six thousand five hundred in 1924.

These figures, coupled with reports from various sections, indicate some improvement over recent years in conditions that obtained on the spawning grounds in 1928.

The collection of salmon eggs in the Fraser River watershed in 1924 compares with that of 1928, as follows:—

—	—	Pitt lake	Cultus lake	Harrison lake	Pemberton	Total
Sockeye.....	1924	5,678,000	5,075,000	6,518,000	31,200,000	48,471,000
	1928	5,550,000	32,656,624	.....	35,010,000	73,216,624
Coho.....	1924	.....	.....	66,000	.....	66,000
	1928	.....	.....	.....	.....	.....
Spring.....	1924	.....	.....	577,500	.....	577,500
	1928	.....	.....	.....	.....	.....
Chum.....	1924	.....	.....	228,000	.....	228,000
	1928	.....	.....	.....	.....	.....
Steelhead.....	1924	.....	4,000	.....	.....	4,000
	1928	.....	14,200	.....	.....	14,200

1924—Total of all salmon—49,346,500.
1928—Total of all salmon—73,230,824.

In the other parts of the province results varied considerably, although on the whole somewhat smaller runs and collections of eggs were made. There was a heavy run of sockeye at Babine and of steelhead at Cowichan lake. Anderson lake also showed an increased run. Heavy floods at Gerrard greatly interfered with operations, and freshets at Lloyds creek damaged the traps considerably. Penask lake carried on experimental collection work.

FRASER RIVER WATERSHED

PITT LAKE HATCHERY

J. McIsaac, Superintendent

A heavy run of sockeye occurred in the Pitt Lake district and in addition to a collection of five million five hundred and fifty thousand eggs, which is slightly larger than that of the previous year, the natural spawning grounds were very well seeded. The usual collecting camps at Four Mile, Seven Mile and Ten Mile creeks, Mountain Slough and Charles Peter's creek were operated. Over one-half million of the fry were retained and fed to the fingerling stage. The 1928 distribution of sockeye from eggs secured the previous season amounted to four million eight hundred and sixty-five thousand one hundred and seventy-three.

CULTUS LAKE HATCHERY

A. Robertson, Superintendent

While the actual fish cultural work at Cultus Lake was conducted by the fish cultural staff, such operations were carried on so as to best suit the program of research laid out by the Biological Board of Canada. In 1927, the whole of the sockeye run that reached the outlet of Cultus Lake was counted over the fences and allowed to proceed to the spawning grounds for natural reproduction. Consequently no local collection for hatchery purposes was made that season, but the hatchery was utilized to take care of nearly four million sockeye eggs that were obtained in Trout or Hatchery creek, Harrison lake. These eggs were eyed at Cultus and returned to the Harrison district for distribution. The run of sockeye in 1928 was of about the same proportions as the run of 1924. The females, however, outnumbered the males to the extent of three to one. The whole of the run of nearly fifteen thousand fish was retained in Sweltzer creek, the outlet of Cultus lake. Some of the early fish were consequently retained for nearly three months, and throughout the season a considerable number died before they could be stripped or had reproduced naturally. Under ordinary hatchery conditions, the early fish are allowed to ascend, and throughout the season the fish that are not donated to the Indians for food are passed over the fences as they are stripped and allowed to ascend to the spawning grounds above. The total collection of eggs at this point amounted to thirty-two million six hundred and fifty-six thousand six hundred and twenty-four eggs. Over twenty-seven and a half million were taken in the usual way, and as the fish were stripped they were slit and the eggs remaining in them secured. This method yielded slightly over five million eggs additional. Six million seven hundred and twenty-four thousand five hundred and seventy-four of the eggs taken were laid down in Cultus Lake hatchery; seven million seven hundred and forty-four thousand in Smiths Falls hatchery, which is adjacent and subsidiary to Cultus; also seventeen million nine hundred and eighty-eight thousand and fifty eggs were sent to Harrison lake and two hundred thousand to Pemberton hatcheries.

A small collection of steelhead salmon eggs was made at Sweltzer creek, viz., fourteen thousand two hundred in the spring of 1928, and thirty thousand Kamloops trout eggs, transferred from Lloyd's creek, were planted from this establish-

ment. 1928 distributions from Cultus amounted to twenty-nine thousand eight hundred and ninety-four Kamloops trout and thirteen thousand five hundred and eighty-three steelhead salmon. Five hundred suckers were also killed in the vicinity by the staff of the Cultus Lake hatchery. Five thousand humpback or pink salmon eggs were taken by the Biological Board for experimental purposes.

HARRISON LAKE HATCHERY

E. V. Epps, Acting Superintendent

The Harrison Lake hatchery, which has not been continuously operated for several years, was fitted up and utilized for handling eggs collected in Cultus lake in excess of the capacity of that place. Seventeen million nine hundred and eighty-eight thousand and fifty sockeye eggs were handled, the first being received on November 24 and the last on December 14. A fair run of sockeye made its appearance in Trout or Hatchery creek at this establishment, but no efforts were made to secure their eggs as it appeared that the hatchery would be taxed to its capacity with eggs from Cultus lake. Three million five hundred and forty-three thousand nine hundred and sixty-five sockeye eyed eggs were distributed locally.

PEMBERTON HATCHERY

T. W. Graham, Superintendent

A satisfactory run of sockeye reached the Birkenhead river in 1928, although somewhat smaller than the run of 1924. This last-mentioned run was considered by the oldest residents to have been the largest that they had ever seen. Thirty-five million and ten thousand eggs were secured (two million by the incision method). This number was supplemented by receipt of two hundred thousand sockeye eggs from Cultus lake and forty-five thousand Kamloops trout from Lloyds Creek hatchery. Thirteen million and thirteen thousand sockeye eggs were transferred to the Stuart Lake district, where eight million and eight thousand were planted in the François and Quesnel lakes, and the balance laid down in Stuart Lake hatchery. A good natural seeding must have occurred because sockeye were arriving in the river and were present in considerable numbers after the fences had been removed and spawning operations had been discontinued. Distributions amounted to forty-two thousand six hundred Kamloops trout and twenty-eight million five hundred and thirty-three thousand sockeye salmon.

STUART LAKE HATCHERY

H. C. Crawford, Superintendent

As it appeared doubtful that the usual allotment of sockeye eggs could be secured in the Fraser river for the Stuart Lake hatchery, collecting operations were undertaken at Fifteen Mile and Pierre creeks, Babine lake. As the season advanced and the usual and expected heavy run did not materialize in Lakelse lake, collecting operations in Babine lake for the Stuart Lake hatchery were terminated, and the eggs obtained—six million one hundred and four thousand—transferred to the Babine hatchery. Five million five thousand sockeye eggs from the Pemberton hatchery were later in the season transferred to Stuart Lake. One million five hundred and eighty-two thousand of this number were planted in the eyed stage in Hoy creek and the remainder were incubated as fry at the hatchery. The distribution of sockeye fry from the Stuart Lake hatchery in barren lakes in the vicinity has for several years given splendid returns in the way of migrating fingerlings and yearling fish. The usual migration did not occur last season, and on investigation it was found that in both Crawford and Rainbow lakes the sockeye had apparently become landlocked, as twenty

sockeye were caught in one night's fishing ranging in size from what appeared to be two-year-old fish to several carrying eggs in a well developed state. In addition to the usual repairs, thirty new hatching troughs were made, the roof of the hatchery reshingled and a new foundation placed under the dwelling-house during the summer.

On October 28, five million five thousand eggs from the Pemberton hatchery reached Burns lake, for the purpose of continuing the seeding that was started in 1926 of the Nadina river at the head of Francois lake. This operation was in charge of Superintendent Hearn of the Lakelse Lake hatchery. Owing to the abnormally low state of the water considerable difficulty was experienced in getting the scow with the eggs to the usual landing place up river. Transportation of eggs and equipment was effected by small boats, team and pack horses, and planting operations were commenced on October 31, but little could be accomplished on account of the extremely cold weather. Owing to the low state of the water the areas that were seeded in previous years did not afford sufficient space, but made available other equally suitable riffles. Operations were satisfactorily completed on November 8. As one of the objects of this planting is to gain information regarding the results that may be expected from the planting of Upper Fraser areas with eggs collected in the Lower Fraser, the various tributaries of Francois lake have been carefully examined since the first seeding was done in 1926. This inspection indicates that in the aggregate extremely few sockeye reached this area in 1928. One dead sockeye was picked up at the mouth of Uncha, but none were observed in Nithe river, Ormond creek or Trout creek. A small number were observed in the Stellaco river, as well as in the Nadina.

The run of sockeye to the Shuswap district was light compared with the runs of the preceding four years, and is estimated by the local officers to have exceeded ten thousand in number. The majority remained in Little river, very few going into Adams river, where an extremely heavy run occurred in 1926. The run at Bridge river canyon on the Fraser was greater than the runs of 1926 and 1927. A small run estimated at four hundred fish entered Seton lake, but none were observed on the usual spawning grounds of Seton or Anderson lakes in this system. An unusual and unexplained run, estimated at from eight to ten thousand, occurred in Raft river, larger than any that had been seen by the residents for many years. Some of these fish were found dead along the river, which had not spawned and did not show any outward bruise or sign of injury. The run to the Chilco lake district is reported to have been the best for at least fourteen years, and is estimated at twenty thousand by the local guardian, while a comparatively small number were observed in Horsefly river in the Quesnel lake system. A small run was observed in the Bowron river. Three million three thousand eyed sockeye eggs from Pemberton were planted in the Quesnel district during the fall of 1928.

RIVERS INLET HATCHERY

F. A. Tingley, Superintendent

The run of sockeye to the various spawning grounds of Owikeno lake, as a whole, was below the average of recent years, but there was no alarming scarcity in any section. The officers who were familiar with the situation are of the opinion that the smaller run of 1928 is attributable to a scarcity of four-year fish, probably due to the abnormal freshet that occurred in the late fall of 1924, which thoroughly scoured the principal spawning grounds of the district. In reporting on this freshet, under date of December 26, 1924, the superintendent of the hatchery at that time said that, "the recent abnormal freshets have so thoroughly scoured out all the creeks and rivers in this district that all the eggs deposited naturally by the salmon have been destroyed so that any return from this year's brood fish will depend on the eggs at present in the hatchery". The

run to Genesi creek was a good average for that stream and the collection of eggs was above the average, as the result of an additional trap and holding the fence until the end of the run. The Genesi sockeye were of a larger average size than usual. The run to Quap consisted of approximately ninety per cent large fish apparently five year old and though it was undoubtedly below the average of recent years, it was in the opinion of the hatchery superintendent not as poor as the collection figures would indicate. Usually during the spawning season there is a succession of freshets that bring the sockeye into the traps in great numbers, but this year there was only one day of high water in the creeks—October 16—when one million six hundred and seventy-five thousand eggs were taken at Quap. In both Quap and Genesi creeks, a great many sockeye spawned below the fence, but in a normal season the majority of these fish would have been trapped. The average height of the lake in October, 1928, was three feet four inches by the guage at the hatchery as compared with five feet four inches for October, 1927, which was a normal season. Towards the end of the season an effort was made to secure spawning sockeye from the Indians who were catching fish for smoking purposes in the Whannock river. The collection of sockeye for 1928 was fourteen million sixty thousand five hundred. All the fry hatched from the collection of 1927 were fed from the time that the food sac was about one-half absorbed until they were fully developed and distributed. A total of twenty million sixty-eight thousand seven hundred and eighty-six sockeye was planted out.

The road, besides the usual minor repairs, was extended about three hundred yards down river to reach a better landing for the freight scow. This extension was graded and a thirty-foot bridge built across a gully. The carpenter shop was raised and a new foundation, including sills, joists and flooring, put in. The exterior of the hatchery and several outbuildings, and the interior of the men's quarters were painted. A new fence at Genesi, a new trap at Quap and a cabin fourteen feet by eighteen feet, for use of the egg planting staff at Indian river, were built.

SKEENA RIVER WATERSHED

The total collection of sockeye eggs in Skeena river watershed, viz., fifteen million and sixty-five thousand, was slightly smaller than that of the previous year.

LAKELSE LAKE HATCHERY

C. R. T. Hearn, Superintendent

The run of sockeye to the Lakelse lake area was considerably smaller than the average run of recent years, notwithstanding the unusual heavy seeding of this district, both naturally and artificially, in 1924. The total collection at this point of five million five hundred and twenty-five thousand eggs, while considerably below the average of recent years, was an improvement on the small collection of 1927. Fences and traps were installed in Granite, Hot Springs, Salmon, Scullabuchan and Williams creeks in preparation for an average run as a result of the heavy natural seeding of four years previously. For some unaccountable reason the hoped for numbers did not materialize and a severe freshet occurred on August 9, which seriously damaged the fences in Williams and Scullabuchan creeks, which are the heaviest producers, and allowed the fish in the traps and below the fences at that time to ascend to the upper waters. This occurrence is estimated to have reduced the collection that would otherwise have been made by approximately three and one-half million eggs. One hundred and thirty thousand Kamloops trout eggs from Lloyds creek were distributed from this station. Good results were obtained from the retaining ponds, into which upwards of one million fry were liberated directly from the troughs. After retention and feeding for a short period, seven hundred thousand were distributed in Lakelse lake; the remainder were held until October. The food

consisted of well-screened fish meal obtained from the Prince Rupert Marine Products Company. All sections of the pond system were deepened, a log gasoline and oil house constructed, exterior of hatchery and mess house painted, and a large quantity of material, including one hundred tons of rock, was placed on the site of the Williams creek fence in preparation for the building of a substantial foundation for the fence at this point, which owing to the alluvial nature of the creek bed is easily damaged by the severe freshets. In addition to the one hundred and thirty thousand Kamloops mentioned above, eight million three hundred and seventy-five thousand five hundred sockeye were distributed.

BABINE LAKE HATCHERY

R. H. Eaton, Superintendent

In comparison with the scarcity of sockeye salmon in the Lakelse lake, Babine lake and its various tributaries carried a heavy run of sockeye. In the early season before the run to this district had developed, Superintendent Crawford of the Stuart Lake hatchery was directed to collect sockeye eggs in Babine lake with a view to utilizing them for seeding the Stuart and François lake districts of the Fraser river, and later replace them with eggs from the lower Fraser. As the commercial pack in the Skeena was not up to expectations, the above-mentioned instructions were cancelled, and the eggs collected by Superintendent Crawford, six million one hundred and four thousand, were transferred to the Babine Lake hatchery. With this shipment was received three million and forty thousand eggs which had been taken in Morrison creek, where a large number of fish were impounded. This creek as well as the various other important streams such as Fifteen Mile, Pierre, Fulton and Babine river were well seeded. Various reports intimated that, with the exception of the Lakelse Lake area, the whole of the spawning grounds of the Skeena river system carried a satisfactory run and will be well seeded in the natural way under favourable low-water conditions. Nearly one and one-half million of the fry were retained in ponds until early July, when rising temperature necessitated their liberation. Babine lake hatchery made a distribution of seven million nine hundred and nine thousand three hundred and seventy sockeye during the year.

The foundations, sills and a considerable portion of the flooring of the mess house and paint shop were renewed, and a woodshed and storeroom built.

VANCOUVER ISLAND

The total collection of salmon eggs for the three hatcheries in Vancouver island was slightly smaller than that of 1927. The numbers obtained at the following points are as follows:—

Anderson Lake hatchery—	
Sockeye salmon.....	8,799,000
Kennedy Lake hatchery—	
Sockeye salmon.....	2,829,600
Cowichan Lake hatchery—	
Spring salmon.....	1,620,000
Steelhead salmon.....	173,700
	<hr/>
	13,422,300

ANDERSON LAKE HATCHERY

David Bothwell, Superintendent

Superintendent Bothwell estimates that seventy thousand sockeye reached the spawning grounds of Anderson lake, which is an increase of five thousand fish over his estimate of the return for 1924. Favourable weather conditions prevailed throughout the egg-collecting season of 1928. No difficulty was experienced in securing all the eggs desired and no adverse condition occurred up to the end of the year to interfere with the results of natural reproduction. The

run of coho is estimated as being ten per cent, the run of chum fifty per cent, and the run of spring salmon to this district ten per cent, respectively, better than the runs of the previous year. Eight million seven hundred and ninety-nine thousand sockeye eggs were taken, of which six hundred and seventy-two thousand were secured by incision after the fish had been spawned in the usual way. Two million and two thousand eyed eggs from the 1928 collection were before the end of December planted in the streams at the head of Great Central lake, and as the natural seeding of Anderson lake was so abundant, smaller plantings will be made in other waters of the district that were not so fortunate. There was a good run of sockeye in Stamp river and the fishway that was built over the Stamp River falls in 1927 proved efficient. Good runs also occurred in the Sproat and Somas rivers. The distribution from Anderson lake hatchery during the year amounted to eight million two hundred and two thousand and sixty-three sockeye.

A new wharf one hundred and twenty-five feet long was built to replace the one that was destroyed during the storms of the previous winter. Two rows of new posts were put under the hatchery, and all the joists, one-half of the floor and the head tank were renewed. A blacksmith shop ten feet by twelve feet was built of split cedar.

COWICHAN LAKE HATCHERY

J. H. Castley, Superintendent

A greater variety of fish are handled at Cowichan Lake than at any other station in the province. These include spring, coho, pink and Atlantic salmon, and steelhead, cutthroat, kamloops, eastern speckled and Cranbrook trout (a cross between kamloops and cutthroat trout). The spring run of spring salmon to Cowichan lake was good, but not so heavy as that of the previous year, while the fall run of this species was equal to the run of 1924, which was the best on record since the hatchery was opened. Not only were the fish numerous, but were larger than the usual average size. The total collection of this species, one million six hundred and twenty thousand, was obtained on one spawning bed in the river within three hundred yards of the hatchery.

There was also a good run of coho salmon, but none were taken, as the hatchery was filled to capacity with eggs of other species.

The run of steelhead was the heaviest in years. A fresh run of this species ascended about the middle of May, which is the latest that was ever observed by the present overseer. Owing to freshets, considerable difficulty was experienced in handling the nets, and the collection of this species, viz., one hundred and seventy-three thousand seven hundred eggs, was slightly smaller than that of last year.

One hundred and five thousand cutthroat were collected in Cottonwood and Nixon creeks and thirty-eight thousand two hundred eastern speckled trout eggs were collected in Spectacle lake. The last mentioned was supplemented by one hundred and five thousand two hundred speckled trout eggs secured from the hatchery ponds.

The cross between kamloops and cutthroat trout mentioned above was made in 1927 at Cranbrook hatchery. A small number of eggs were shipped to Cowichan where they hatched out. At the end of 1928, forty-six still survived, then over one and one-half years old. Local collections were augmented by allotments of two hundred thousand kamloops trout eggs from Lloyd's creek; one hundred and seventy-three thousand three hundred and sixty cutthroat trout eggs from a commercial firm, and one million atlantic salmon eggs from the Miramichi hatchery, one hundred thousand of which were planted in the Alberni district as eyed eggs; also five thousand pink salmon collected by the research station at Cultus Lake and transferred to Cowichan for observation until maturity, if possible.

Angling in the river is reported to have been considerably above the average of recent years.

Over two hundred and thirty-three thousand of different species were distributed as fingerlings.

The following distributions were made during 1928: Atlantic salmon—eight hundred and ninety thousand and seventy; coho salmon—four hundred and ninety-nine thousand three hundred and eighty; cutthroat trout—two hundred and twenty-one thousand three hundred and twenty-nine; kamloops trout—two hundred thousand five hundred and sixty-four; speckled trout—sixty thousand eight hundred and thirty-eight; spring salmon—one million seventy-five thousand five hundred and seventy-seven; steelhead salmon—one hundred and sixty-three thousand two hundred and sixty—a total of three million one hundred and eleven thousand and eighteen.

KENNEDY LAKE HATCHERY

W. P. Forsythe, Superintendent

As Superintendent Forsythe was in charge of egg collecting operations at Cultus Lake during the autumn of 1928, and as Superintendent Robertson of that station was engaged in observations at Hell's Gate canyon, egg collecting operations at Kennedy Lake were therefore in charge of Mr. G. J. Morgan. Although the commercial catch of sockeye in the Clayoquot sound was above the average of recent years, there was a comparatively small escapement to the spawning grounds of Kennedy lake. The first fish was caught on October 24, and the last on November 9, a total of two thousand one hundred and twelve being taken. Of this number eight hundred and forty-nine only were females, which yielded two million eight hundred and twenty-nine thousand six hundred sockeye eggs. The small run of sockeye that usually ascend the streams tributary to Kennedy lake in June and spawn in late August and early September did not appear, although one hundred and eighty-three thousand eggs were taken from this run in 1924. The run to Elk river that year was estimated at upwards of one thousand fish. The later run from which the eggs are secured was estimated at between three and four thousand fish, with males and females in the proportion of almost three to one. The spawning grounds of Clayoquot arm, Cold creek and Clayoquot river were lightly seeded and no sockeye were observed in Elk river. Weather conditions were favourable and no freshets or other injurious conditions occurred up to December 31. The distribution from the 1927 collection was three million one hundred and thirty-nine thousand and fifty sockeye.

One new pond was excavated and finished of the series adjacent to the hatchery. Two additional ponds were excavated and will be completed in time to be of service in handling the 1929 hatch. No fry were this season distributed direct from the hatchery troughs. They were released into the series of ponds above mentioned, through the hatchery outlet flumes, where they were fed for from a week to ten days. The fry are conveyed from these ponds through pipes direct to the distributing scows by which they are distributed as desired over the whole of the lake. They are not handled with dip-nets or in any other way during the process of distribution.

SOUTHERN INTERIOR

NELSON-GERRARD HATCHERIES

Weldon Reid, Superintendent

The Nelson-Gerrard hatcheries cover an extensive territory and collect and distribute several species. Six hundred and ninety thousand two hundred speckled trout eggs were collected in Boundary and Violin lakes where the species were introduced a comparatively short time ago. When the rainfall is small, the water of Boundary lake is inclined to become stagnant, and this

condition is reflected in the quality of the eggs secured. While water conditions, and consequently the eggs were better than they were last year, they received some unavoidable injury from their transfer for a distance of fifty miles over roads that were undergoing repairs. Four hundred and eighty-five thousand four hundred and fifty were obtained from this lake, and two hundred and four thousand seven hundred and fifty of good quality from Violin lake.

Three hundred and twenty-nine thousand two hundred and sixty rainbow trout eggs were collected in Cottonwood and Six Mile lakes. Local collections were supplemented by allotments of three hundred thousand kamloops trout eggs from Gerrard and thirty thousand speckled trout eggs from Spokane hatchery, U.S.A., the latter in exchange for fifteen thousand kamloops trout fry from Nelson. Thirty thousand speckled trout eggs from here were sent to Cranbrook hatchery in exchange for cutthroat trout.

Two hundred and twenty-three thousand two hundred redfish or Kokanee eggs were collected in the West Arm of Kootenay lake, about fifteen miles east of Nelson. This is the first collection of the species in the district, and was made with a view to its re-establishment in Okanagan lake where their spawning grounds have been seriously decreased by irrigation projects. In 1928 distributions from Nelson amounted to one million two hundred and sixty-three thousand two hundred and fifteen as follows: Kamloops trout—two hundred and ninety-nine thousand and eight; Kennerly's salmon—two hundred and five thousand; rainbow trout—three hundred and eighteen thousand one hundred and forty-two; speckled trout—four hundred and forty-one thousand and sixty-five.

Exhibits of various species were made at the Nelson Fair, held during the autumn of 1928.

The Gerrard hatchery is subsidiary to Nelson and is devoted to the propagation of kamloops trout, of which species five hundred and fifty-one thousand seven hundred eggs were collected. A good run of such fish took place in the Lardeau river in 1928. High water, which occurred about a month earlier than usual, and reached a greater height than it ever did before in the memory of local residents, greatly interfered with operations. Fences and pens were flooded and broken and there was four feet of water in the hotel at Gerrard. Two hundred and sixteen thousand two hundred and fifty-one kamloops trout were planted out from this hatchery during the year.

LLOYD'S CREEK EYEING STATION

G. J. Morgan, Acting Superintendent

Traps were operated in Paul and Pinantan creeks and Hyas Long lake for kamloops trout. The first fish appeared in the creeks on April 22 at a time when freshet conditions were experienced which did considerable damage to all the traps. These conditions continued for the first two weeks of the season and made the roads practically impassable, so that the crew were unable to give the usual attention to the traps at the two places last mentioned. The traps at Pinantan were badly flooded during this period and consequently the collection of eggs was not up to that of the previous year. The collection at Paul creek was well up to the average, while that at Hyas Long lake was smaller than was expected. Owing to these unfavourable conditions the total collection was nearly one million smaller than that of 1927.

The total collection was one million six hundred and ninety-eight thousand kamloops taken from the following collection points: Paul creek—one million and ninety-six thousand; Pinantan creek—four hundred and sixty-five thousand; Hyas-Long lake—one hundred and thirty-seven thousand. The following shipments of eyed eggs were made: Cowichan Lake hatchery—two hundred thousand; Cultus Lake hatchery—thirty thousand; Lakelse Lake hatchery—one hundred and thirty thousand; Pemberton hatchery—forty-five thousand; Cranbrook hatchery—one hundred and fifty thousand; Japan—fifty thousand. The distribution from the hatchery was one million and thirty-nine thousand.

SUMMERLAND HATCHERY

The hatchery at Summerland has up to the present been operated under the direction of Fishery Overseer Gartrell, and has been utilized only for the hatching of eggs from other points, and no local collections have been made. It is being utilized in connection with the introduction of eastern whitefish into the larger lakes of southern British Columbia, and in February, 1928, five million such eggs, which were collected in Lake Winnipegosis, were transferred from the Fort Qu'Appelle hatchery where they had been eyed. The resultant fry—four million seven hundred and eighty thousand—were distributed in Okanagan lake. Allotments of kamloops trout and little redfish, or kokanee eggs were handled at this station for a short period before they were distributed. The numbers planted out have in this case, due to their short retention, been credited to the originating hatcheries as follows: Kamloops trout—Penask lake, one hundred and twenty thousand; little redfish—Nelson hatchery, two hundred and five thousand.

PENASK LAKE

Early in May, 1928, Hatchery Assistants A. P. Hills of the Cowichan Lake hatchery, and J. W. Dalzell, of the Pemberton hatchery, were assigned to undertake egg collecting operations in an experimental way to ascertain the prospects for making reasonable collections of kamloops eggs in Penask and adjoining lakes in Nicola valley. These officers found conditions rather unfavourable largely due to the heavy snowfall of the previous winter, which caused greater and more prolonged freshets than were expected. It was also necessary for them to improvise accommodation and build the necessary fences and retainers. Two hundred and eleven thousand five hundred kamloops eggs were secured, and in view of the apparent abundance of trout, arrangements have been made to continue operations on a more permanent basis with a view to establishing a permanent collecting camp should the result of next spring's operations warrant such expenditure. A distribution of two hundred thousand nine hundred and seventy-five kamloops was made.

CRANBROOK HATCHERY

Mr. H. J. Ryder, Assistant at the Anderson Lake hatchery, was again in charge of operations at the Cranbrook hatchery which was built and is maintained by various local organizations. The department each season loans an experienced hatchery officer, has loaned certain equipment, and in 1928 contributed to the extent of three hundred dollars towards the cost of egg collection. The distribution of the output is under the direction of the Department and not more than twenty-five per cent is distributed outside of the Cranbrook district. Local collections were supplemented by thirty thousand speckled trout from Nelson and one hundred and fifty thousand kamloops trout from Lloyd's creek. The average collection of cutthroat trout eggs is larger than that made from any other hatchery in British Columbia.

The 1928 collection of cutthroat trout eggs taken in Fish and Munroe lakes amounted to eight hundred and fifty-four thousand one hundred and ninety. Twenty-one thousand Cranbrook or hybrid trout were also taken in Munroe lake. Fifty thousand cutthroat trout eggs were sent to Tokyo Angling and Country Club, Tokyo, Japan, and ninety-seven thousand five hundred cutthroat to Stanley Park hatchery, British Columbia.

Distributions for 1928 were as follows: cranbrook or hybrid trout—sixteen thousand six hundred and fifty; cutthroat trout—seven hundred and fifteen thousand seven hundred and fifty; kamloops trout—one hundred and forty-four thousand eight hundred; speckled trout—thirty thousand; a total of nine hundred and seven thousand two hundred.

The following table shows by species the local collections of eggs made during 1928, the points where such eggs were taken and hatchery in which the eggs were laid down with numbers laid down in each case.

Species	Collection Area	Number collected	Laid down in	Number laid down	Subtotals	Totals
Atlantic salmon.....	Big rock, Margaree river, N.S.	32,500	Margaree hatchery.....	32,500		
	Rossville brook, Margaree river, N.S.	2,266	Margaree hatchery.....	2,266		
	Margaree pond, Margaree harbour, N.S.	2,515,000	Margaree hatchery.....	2,515,000	2,519,766	
	River Philip, Cumberland county, N.S.	2,460,500	Antigonish hatchery.....	422,000	422,000	
			Bedford hatchery.....	2,038,500	2,038,500	
	Miramichi pond, South Esk, N.B.	7,470,723	Middleton hatchery.....	1,335,537	1,335,537	
			Miramichi hatchery.....	6,135,186	6,135,186	
	New Mills pond, New Mills, N.B.	1,723,235	Restigouche hatchery.....	1,723,235		
	Matapedia river, Matapedia county, Que.	583,300	Restigouche hatchery.....	583,300	2,306,535	
	St. John pond, Little river, N.B.	7,239,660	Florenceville hatchery.....	2,577,960	2,577,960	
Speckled trout.....	Morell river, Kings county, P.E.I.	718,500	Grand Falls hatchery.....	3,643,120	3,643,120	
	Margaree hatchery ponds, N.E. Margaree, N.S.	91,122	St. John hatchery.....	1,018,580	1,018,580	
	Polletts cove, Pleasant bay, N.S.	6,200	Kellys Pond hatchery.....	718,500	718,500	22,715,684
	Pond river, Pleasant bay, N.S.	49,925	Margaree hatchery.....			
	Other brook, Pleasant bay, N.S.	1,600	Margaree hatchery.....	49,925		
	Red river, Pleasant bay, N.S.	51,950	Margaree hatchery.....	1,600		
	Sandy cove, Pleasant bay, N.S.	2,060	Margaree hatchery.....	51,950		
	Florenceville hatchery ponds, Florenceville, N.B.	(a)304,088	Florenceville hatchery.....	2,060	202,857	
	St. John hatchery ponds, St. John, N.B.	1,466,108	St. John hatchery.....	304,088	304,088	
	Blooming Point pond, P.E.I.	89,443	Kellys Pond hatchery.....	1,466,108	1,466,108	
Landlocked salmon.....	Cole's pond, P.E.I.	6,333	Kellys Pond hatchery.....	39,443		
	Gillans stream, P.E.I.	25,593	Kellys Pond hatchery.....	6,333		
	Kellys Pond, P.E.I. (hatchery pond)	(a)34,735	Kellys Pond hatchery.....	25,593		
	Ings Pond, P.E.I.	153,710	Kellys Pond hatchery.....	34,735		
	Morell river, P.E.I.	11,100	Kellys Pond hatchery.....	153,710		
	Watts stream, P.E.I.	36,997	Kellys Pond hatchery.....	11,100		
	Spectacle lake, Vancouver Island, B.C.	38,200	Cowichan lake hatchery.....	36,997	357,911	
	Cowichan hatchery ponds, Cowichan lake, B.C.	105,200	Cowichan lake hatchery.....	38,200	143,400	
	Boundary lake near Nelson, B.C.	485,450	Nelson hatchery.....	105,200		
	Violin lake near Nelson, B.C.	204,750	Nelson hatchery.....	485,450		
Whitefish.....	Chamcook lakes, N.B.	168,004	St. John hatchery.....	204,750	690,200	3,164,564
	Waterhen river, Lake Winnipegosis, Man.	121,000,000	Winnipegosis hatchery.....	168,004	168,004	168,004
	Dauphin river, Lake Winnipeg, Man.	96,375,000	Ft. Qu'Appelle hatchery.....	96,000,000	96,000,000	
	Pigeon Bay, Lake Winnipeg, Man.	2,850,000	Gull Harbour hatchery.....	25,000,000	25,000,000	
	Creek joining Jackfish-Murray lakes, Cochin, Sask.	18,500,000	Bereens river.....	96,375,000	96,375,000	
	Lesser Slave lake, Alta.	4,200,000	(b)Pigeon Bay.....	375,000	375,000	
	Valley river, Lake Dauphin, Man.	18,500,000	Ft. Qu'Appelle hatchery.....	2,850,000	2,850,000	
	Swan creek, lake Manitoba, Man.	187,340,000	Lesser Slave lake hatchery.....	4,200,000	4,200,000	
	Quarry lake Winnipeg, Man.	17,310,000	Winnipegosis hatchery.....	18,500,000	18,500,000	243,300,000
	Creek joining Jackfish-Murray lakes, Cochin, Sask.	19,380,000	(b)Swan creek district.....	340,000	340,000	
Pickereel.....	Arnolds point, Sioux river and lake, Sask.	10,455,000	Gull Harbour hatchery.....	187,340,000	187,340,000	
			Ft. Qu'Appelle hatchery.....	17,510,000	17,510,000	
				19,380,000	19,380,000	
				10,455,000	29,835,000	235,025,000

The following summary gives, by species, the total receipt of eggs during the year ended December 31, 1928:—

Atlantic salmon.....	22,745,684
Landlocked salmon.....	168,004
Rainbow trout.....	350,615
Cutthroat trout.....	490,570
Steelhead salmon.....	187,900
Kamloops trout.....	2,461,200
Sockeye salmon.....	113,970,724
Spring salmon.....	1,620,000
Speckled trout.....	3,164,564
Whitefish.....	243,300,000
Salmon trout.....	338,850
Pickeral.....	235,025,000
Brown trout.....	150,272
Brown trout (Hybrid).....	10,500
Lochleven trout.....	58,222
Kennerly's salmon.....	223,200
	<hr/>
	624,265,305

The following purchases were also made:—

Cutthroat trout eyed eggs from Castle lake Trout Co., Creed, Colorado, laid down in Stanley Park hatchery, Vancouver, B.C.....	8,000
Cutthroat trout eyed eggs from Columbia River Trout hatchery, Vancouver, Washington State, laid down as follows:—	
Cowichan Lake hatchery.....	173,360
Stanley Park hatchery.....	50,640
	<hr/>
	224,000
Cutthroat trout eyed eggs from S. S. Drew, Troy, Montana, laid down in Banff hatchery, Alta.....	200,000
Rainbow trout eyed eggs from Trout Brook Co., Hudson, Wis., laid down in Banff hatchery, Alta.....	219,000
Speckled trout eyed eggs from American Fish Culture Co., Carolina, R.I., laid down as follows:—	
Antigonish hatchery.....	460,960
Bedford hatchery.....	473,200
Yarmouth hatchery.....	490,300
Florenceville hatchery.....	452,985
St. John hatchery.....	16,240
	<hr/>
	1,893,685
Speckled trout eyed eggs from Paradise Brook Trout Co., Stroudsburg, Pa., laid down as follows:—	
Bedford hatchery.....	1,000,000
Middleton hatchery.....	600,000
Florenceville hatchery.....	1,000,000
Grand Falls hatchery.....	900,000
Kelly's Pond hatchery.....	500,000
Jasper Park hatchery.....	250,000
	<hr/>
	4,250,000
	<hr/>
	6,794,685
Grand total of eggs received during calendar year 1928.....	<u>631,059,990</u>

The following exchanges were made:—

In exchange for Atlantic salmon—	
Brown trout eyed eggs from Trout Brook Co., Hudson, Wisconsin, laid down in Banff hatchery, Alta.....	155,230
Rainbow trout eyed eggs from State of New Hampshire, laid down in Banff hatchery, Alta.....	483,600
Lochleven trout eyed eggs from United States Bureau of Fisheries, laid down as follows:—	
Banff hatchery, Alta.....	352,256
Ft. Qu'Appelle hatchery, Sask.....	152,100
	<hr/>
	504,356
Cutthroat trout eyed eggs from United States Bureau of Fisheries, laid down as follows:—	
Banff hatchery, Alta.....	962,800
Waterton lakes hatchery, Alta.....	88,050
	<hr/>
	1,050,850
Cutthroat trout eyed eggs from State of New Hampshire, laid down in Banff hatchery, Alta.....	537,600
In exchange for Kamloops and Speckled Trout:—	
Cutthroat trout eyed eggs from Cranbrook hatchery, laid down in Stanley Park hatchery, B.C.....	97,500
In exchange for Kamloops trout—	
Speckled trout eyed eggs from R. H. Yorke, Metaline Falls, Washington, laid down in Nelson hatchery, B.C.....	30,000
	<hr/>
	2,859,136

STATEMENT OF EGGS AND FISH SUPPLIED TO OTHER THAN DOMINION
GOVERNMENT HATCHERIES DURING 1928

Species	Number	Eggs or Fish	Source	To
Atlantic salmon.	(a) 4,370	Eggs	Bedford hatchery.....	Biological Board.
Atlantic salmon.	500,000	"	Miramichi hatchery....	Trout Brook Co.—Exchange for Brown trout shipped via Warren Fish hatchery, Warren, N.H.
Atlantic salmon.	1,000,000	"	"	State of New Hampshire, Warren Fish hatchery, Warren, N.H.—Exchange for Rainbow trout.
Atlantic salmon.	1,000,000	"	"	United States Bureau of Fisheries, East Orland, Maine, U.S.A.—Exchange for Cutthroat trout.
Atlantic salmon.	(a) 1,208	Fish	{ Bedford hatchery (51). St. John hatchery (1157) }	Biological Board.
Kamloops trout.	50,000	Eggs	Lloyd's Creek hatchery	Tokyo Angling and Country Club, Tokyo, Japan.—Sold.
Kamloops trout.	150,000	"	"	Cranbrook hatchery.—Exchange for Cutthroat trout.
Kamloops trout.	15,000	Fish	Nelson hatchery.....	R. H. Yorke, Esq., Metaline Falls, Washington, U.S.A.—Exchange for speckled trout eyed eggs.
Cutthroat trout..	50,000	Eggs	Cranbrook hatchery....	Tokyo Angling and Country Club, Tokyo, Japan.—Sold.
Cutthroat trout.	97,500	"	"	Stanley Park hatchery, B.C. Anglers' Association.—Exchange for Kamloops and speckled trout eggs supplied by Department.
Cutthroat trout.	8,000	"	Castle Lake Trout Co...	Stanley Park hatchery, B.C. Anglers' Association.—Sold.
Cutthroat trout.	50,640	"	Columbia river trout hatchery.	Stanley Park hatchery, B.C. Anglers' Association.—Donation.
Speckled trout..	(a) 5,050	"	Bedford hatchery.....	Biological Board.
Speckled trout...	1,350	"	Middleton hatchery....	G. D. Campbell, Weymouth, N.S.—Sold.
Speckled trout...	30,000	"	Nelson hatchery.....	Cranbrook hatchery.—Exchange for Cutthroat trout.
Speckled trout...	(a) 1,157	Fish.....	St. John hatchery.....	Biological board.

(a) The Research Committee on Fish Culture of the Biological Board was supplied as requested with such eggs and fry as were available at the various hatcheries.

In the interest of economy and convenience in the distribution of fry, the following transfers of eyed eggs were made in 1928:—

Species	From	To	Number
Atlantic salmon.....	(a) Bedford hatchery.....	Lindloff hatchery.....	800,000
	(a) Grand Falls hatchery...	Tobique hatchery.....	700,000
	(a) St. John hatchery.....	Florenceville hatchery.....	1,000,000
	(a) Restigouche hatchery...	Nipisiguit hatchery.....	365,650
	(a) Miramichi hatchery.....	Nipisiguit hatchery.....	150,000
	(a) Miramichi hatchery.....	Florenceville hatchery.....	1,000,000
	(a) Miramichi hatchery.....	Grand Falls hatchery.....	700,000
	(a) Miramichi hatchery.....	Kelly's Pond hatchery.....	450,000
	(a) Miramichi hatchery.....	Cowichan Lake hatchery...	(c) 1,000,000
Whitefish.....	(a) Fort Qu'Appelle.....	Summerland hatchery.....	5,000,000
Kamloops trout.....	(b) Gerrard hatchery.....	Nelson hatchery.....	300,000
	(b) Lloyds Creek hatchery..	Cowichan Lake hatchery...	200,000
	(b) Lloyds Creek hatchery..	Cultus Lake hatchery.....	(d) 30,000
	(b) Lloyds Creek hatchery..	Lakelse Lake hatchery.....	130,000
	(b) Lloyds Creek hatchery..	Pemberton hatchery.....	45,000
Sockeye salmon.....	(b) Stuart Lake hatchery...	Babine Lake hatchery.....	6,104,000
	(b) Pemberton hatchery....	Stuart Lake hatchery.....	(e) 13,013,000

(a) 1927—Fall collection.	
(b) 1928—Collection.	
(c) Laid down in Cowichan hatchery.....	900,000
Planted as eyed eggs in Alberni district.....	100,000
	<hr/> 1,000,000
(d) Laid down in Cultus Lake hatchery.....	2,000
Planted as eyed eggs.....	28,000
	<hr/> 30,000
(e) Laid down in Stuart Lake hatchery.....	5,005,000
Planted as eyed eggs in Francois Lake district.....	5,005,000
Planted as eyed eggs in Quesnel Lake district.....	3,003,000
	<hr/> 13,013,000

The following transfers of speckled trout brood stock were made during 1928:—

From	To	Number
St. John hatchery.....	Antigonish hatchery.....	800
“.....	Yarmouth hatchery.....	800
“.....	Florenceville hatchery.....	1,050

MARKING OF FISH

With a view to obtaining definite information regarding the movements of the whitefish that are taken for hatchery purposes at the egg collecting camps at the mouth of the Dauphin river, lake Winnipeg, and at the entrance to Waterhen river, lake Winnipegosis, the marking of such fish at these points, which was commenced in the previous year, was continued in 1928. Considerable speculation and difference of opinion has existed for sometime amongst the interested fishermen regarding the movements of whitefish in these lakes and connecting waters, some being of the opinion that fish from lake Winnipegosis migrated to lake Winnipeg and vice versa.

Aluminum tags were attached to the caudal fin of the fish. In 1927 those used in lake Winnipeg were marked with the letter “A”, while those used in lake Winnipegosis were blank. In 1928 those used in lake Winnipeg were marked with the letter “O”, and those in lake Winnipegosis with the letter “B”. Recaptures that have been reported to date indicate that any considerable migration does not occur between the lakes mentioned. Eighteen of the tags attached in lake Winnipeg in 1927 have been returned. Six of these fish were taken in lake St. Martin, and the remainder in lake Winnipeg. Two hundred and forty of the tags attached at this point in 1928 have been returned to date. All of these were obtained from fish that were taken in lake Winnipeg, not far from the point where they were liberated. One hundred and ninety-four of the tags that were attached in lake Winnipegosis in 1927 have been returned, and a considerable number of marked fish reported. One of these recaptures was made in Waterhen lake, and the remainder in lake Winnipegosis. The points at which the recaptures were made indicate a decided migration from the southerly to the northerly end of the lake. No recaptures of fish that were marked in 1928 were reported to the Department up to the end of that year. The following marking of whitefish and salmon was done in 1928:—

STATEMENT OF THE MARKING OF SALMON AND WHITEFISH DURING 1928

	Species	Number marked	Date of marking	Nature of Mark	Object—To throw some light on
Margaree river, N.S.	Atlantic salmon stripped	100	Dec. 4.	Silver tag attached to dorsal fin.	The movements of the salmon that resort to this river to spawn.
Miramichi river, N.B.	" "	100	Oct. 31.	" "	" "
Matapedia river, N.B.	" "	100	Oct. 26-29.	" "	" "
Tabusintac river, N.B.	Atlantic salmon unstrip-	17	May 16-18; 22, 27.	" "	" "
" "	ped.	8	Oct. 19-20.	" "	" "
Anderson lake, Ternan creek, B.C.	Atlantic salmon stripped	183	Oct. 6.	Removal of adipose fin.	The movements of the fingerlings and the percentage that return as adults.
Kennedy Lake, B.C.	" "	506	Jan. 6.	Removal of adipose fin and anal fin.	" "
" "	" "	7,970	Oct. 26-Nov. 1.	Removal of adipose fin and posterior portion of anal fin.	" "
Lake Winnipeg, Dauphin River, Man.	Whitefish, unstriped.	2,478	Sept. 26-29; Oct. 1-3, 5-6.	Tags series "O," attached to caudal fin.	The movements of whitefish in this lake.
Lake Winnipegosis, Waterhen river, Man., and hatchery lagoon.	Whitefish (2,038 unstriped 423 stripped).	2,461	Sept. 28-30; Oct. 1, 2, 6, 8, 12, 13, 15, 17, 19, 22, 23; Nov. 8-10.	Tag series "B" attached to caudal fin.	" "

EXPANSION

Necessary repairs, considerable improvement, and expansion was made at existing hatcheries, and new hatcheries were established at Antigonish and Yarmouth, N.S., and at Swan River, lake Manitoba.

The Yarmouth hatchery is located at the outlet of lake George, Yarmouth county. The hatchery building is seventy-four and one-half feet long by thirty-eight feet wide, and is equipped with forty standard hatchery troughs each sixteen feet long, and with sixteen floor tanks each fourteen feet long by twenty-four inches wide. Provision is also provided for two living rooms for the staff, an office, feed room, ice storage, coal room and storage space for equipment. The dwelling is thirty feet square, containing seven rooms and bathroom. A double garage is also provided. The rearing pond system consists of twelve ponds each one hundred and fifty feet long by five feet wide, constructed with reinforced concrete side walls and gravel bottoms. This system may be extended to a considerable extent as desired. The water supply is provided by a reinforced concrete dam at the outlet of lake George, with an eight-inch wood stave pipe to the hatchery, and a twelve-inch pipe to the rearing ponds. The dwelling is equipped with sanitary plumbing, heated with a hot air furnace, and all buildings are lighted with electricity developed by a gasoline operated plant.

The Antigonish hatchery is similar to the Yarmouth establishment, and is located at Frasers Mills on the South river, fourteen miles from the town of Antigonish. The water supply is obtained from the South river, where a concrete dam, equipped with a fishway, was built. A twenty-inch wood stave pipe conducts the water from the dam to the hatchery, and the rearing ponds. The rearing pond system consists of twelve ponds each one hundred and fifteen feet long by five feet wide, constructed with concrete side walls and gravel bottoms. This system may be extended to a considerable extent as development warrants.

After investigation and test fishing, extending over three seasons, a pickerel hatchery was constructed on Swan creek, on the easterly side of lake Manitoba, near the town of Lundar. The hatchery building is fifty-seven and one-half feet long by thirty-one and one-half feet wide, one story, and contains two hatching batteries each twenty-two feet long, with five tiers of troughs which provide accommodation for three hundred and twelve hatching jars. The floor tank is twenty-one feet ten inches by eight feet eight inches, inside dimensions. Three rooms are provided under the same roof for the staff. The water supply is obtained from Swan creek by means of a steam boiler and duplex pump.

The names of the waters that were stocked during the calendar year 1928 from the several hatcheries, with the size of the individual allotments, are given in the following statements:—

183

	Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon fry	Atlantic salmon ad- vanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speck- led trout eyed eggs	Speck- led trout No. 1 finger- lings	Speck- led trout No. 2 finger- lings
Ashburn Golf and Country Club (Halifax Co.)—									
Artificial Pond.....								500	
Barney river (Pictou Co.)—									
Brora lake.....								2,500	
Barrington Passage—									
Barrington river—									
Left branch.....					20,000				
Lish's brook.....					20,000				
Bedford Basin—									
Anderson lake.....									
Jack's lake.....									30,000
Sackville river.....				130,000		15,000			4,000
Little Sackville river.....						15,000			
William's lake.....									3,000
Biological Board.....									30,000
Atlantic Experimental Station.....		4,000					5,000		
Prof. Bean Dalhousie University.....		20							
Mr. Bellevue.....	300								
Dr. Leim, Dalhousie University.....		50					50		
Prof. Gowanlock, Dalhousie University.....			51						
Canadian National Bungalow Camps pond, near Pictou, N.S.....									12,000
Chezetcook river.....									
Chezetcook Inlet.....					20,000			20,000	
Conrod's lake.....									
Cole Harbour (Guys. Co.)—									
Chain lake.....									
Little Salmon river.....				66,000	20,000			30,000	
East river (Halifax Co.)—									
Whiteford lake brook.....								22,000	
East river (Lun. Co.)—									
Whistler lake.....								22,000	
East river (Pictou Co.).....						30,000			
Battery lake.....								5,000	
Gordon lake.....									4,000
McDonald's lake.....								2,500	
McLellan's brook lake.....								5,000	
Small lakes.....								30,000	
Taylor's lake.....								2,500	
West Branch.....								10,000	
West Branch lake.....								32,000	
Echo lake (Halifax Co.)—									
Big Salmon river.....					86,000				
Folleigh river (Col. Co.)—									
Folleigh lake.....								32,000	
Gaspereau river.....									
Gaspereau lake (Guys. Co.).....					25,000				
Hubbard river (Halifax Co.)—									
Sawlor river.....					33,000				
Jordan Bay—									
Jordan river (Shelb. Co.)—									
Four Mile Brook.....					50,000				
Larry's lake (Guys. Co.)—									
Donohue lake.....								22,000	
Maccan river (Cumberland Co.).....						24,700		30,000	20,000
Harrison lake.....									
Mahone Bay.....									
East river (Lun. Co.).....						60,000			
Gold river (Lun. Co.).....					30,000				
Martin river (Lun. Co.).....						20,000			
Middle river (Lun. Co.).....					30,000				
McGrath Pond (Pictou Co.).....								5,500	
Merigomish Harbour—									
Barneys river (Antig. Co.).....					35,000				
French river (Pictou Co.).....					15,000			5,000	
Branch.....					15,000				
Sutherland river.....								2,500	
Gairloch lake.....	</								

BEDFORD HATCHERY—*Concluded*

	Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon fry	Atlantic salmon ad- vanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speck- led trout eyed eggs	Speck- led trout No. 1 finger- lings	Speck- led trout No. 2 finger- lings
Oisier river (Halifax Co.).....				66,000					
Black Point lake.....								40,000	
Five Island lake.....								25,000	
Sheldrake lake.....									8,000
Parrsboro river (Cum. Co.)—									
Leak's lake.....									25,000
Petpeswick river (Halifax Co.)—									
Petpeswick lake.....								20,000	30,000
River John (Pictou Co.)—									
Black river.....								8,250	
Diamond brook.....								2,750	
East Branch.....								5,500	
Gammon brook.....								2,750	
Stewarts brook.....								2,750	
Sutherlands brook.....								2,750	
West branch.....								11,000	
Salmon river (Guys. Co.).....					30,000				
Salmon river (Col. Co.)—									
Archibalds ponds.....									5,000
Riversdale lake.....								20,000	
Sea—									
Grants lake (Guys. Co.).....								10,000	
Morrison lake (Guys. Co.).....								20,000	
Shag Bay—									
Nine mile river.....				66,000					
Shubenacadie river—									
Charles lake.....									12,000
Kings or Brierly brook.....				33,000					
Kinsac river.....				33,000					
Roden river.....					20,000				
Waverley lake.....				66,000					
South river (Antigonish Harbour).....					40,000				
St. Croix river—									
Meander river (Hants Co.).....					16,000				
St. Marys river—									
East St. Marys river (Pictou Co.).....					35,000				
West St. Marys river (Pictou Co.).....						30,000			
Tatamagouche Harbour—									
French river (Col. Co.).....					30,000				
Terence Bay—									
McGrath lake (Halifax Co.).....								15,000	30,000
Hatchet lake.....									10,000
Tracadie Harbour—									
Tracadie river (Antig. Co.).....					40,000				
West river (Antigonish Co.).....					40,000				
Gaspereau lake.....								30,000	
West river (Pictou Co.).....					33,000				
Eight Mile brook.....								2,750	
Four Mile brook.....								5,500	
Six Mile brook.....								2,750	
Ten Mile brook.....								5,500	
	300	4,070	51	460,000	898,000	194,700	5,050	541,500	278,000

Total distribution.....2,381,671

LINDLOFF HATCHERY

(Subsidiary to Margaree hatchery)

	Atlantic salmon fry
Black river—	
McRea farm.....	50,000
Dennys river.....	50,000
Framboise river—	
Sterling.....	50,000
Ferguson's lake—	
McKillops.....	31,000
Grand lake—	
Kytes brook.....	40,000
McKenzie's farm.....	75,000
Inhabitants river—	
MacDonalds brook.....	50,000
Maddans river—	
McLean farm.....	40,000
Loch Lomond lake—	
Toms brook.....	50,000
Salmon river (Terra Nova).....	100,000

LINDLOFF HATCHERY—*Concluded*

Scotts river—	Atlantic salmon fry
Murray farm.....	50,000
Tillard river—	
East Tillard.....	60,000
West Tillard.....	75,000
Ross brook.....	25,000
	746,000
Total distribution.....	746,000

MARGAREE HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout old fish
Baddeck river—				
Baddeck forks.....		50,000		
Harris brook.....			5,000	
McRae's brook.....		50,000		
North Branch.....		100,000		
Red Bridge.....		100,000		
Margaree river—				
Big Brook.....	50,000		10,000	
Big Intervale Bridge.....	50,000			
Black Rock Pool.....		100,000		
Crowdis bridge.....		100,000		
Dunn's brook.....	50,000		5,000	
Egypt brook.....			10,000	
Etridge Pool.....		50,000		
Gallants Brook.....	50,000			
Greigs crossing.....		100,000		
Hannigan's brook.....	100,000			
Harts brook.....			5,000	
Harts pool.....		100,000		
Harvard lakes.....	50,000			
Hatchery brook.....			26,900	428
Ingraham's pool.....		90,000		
Levis brook.....	50,000			
Little River Cheticamp.....	50,000			
Plateau brook.....		25,000		
McDaniel's brook.....	50,000			
McDermid's crossing.....		100,000		
McDermid's brook.....			5,000	
McDonald's brook.....			5,000	
McLeod's brook.....			10,000	
Mill brook.....			5,000	
Nelson's brook.....			5,000	
Rossville brook.....	50,000			
Tingley's crossing.....	100,000			
Watson's brook.....	50,000			
Whitley's pool.....		125,000		
Middle river—				
Beaver brook.....		50,000		
Foot bridge.....		50,000		
Indian brook.....		50,000		
McLennan's bridge.....		50,000		
St. Ann's Bay—				
Barasois river.....	75,000	25,000		
Church brook.....			5,000	
Goose cove.....			5,000	
South Gut.....			5,000	
St. Ann's river.....		50,000		
Smith pool.....		50,000		
Whycocomagh Bay—				
Indian brook.....		50,000		
	775,000	1,465,000	106,900	428
Total distribution.....			2,347,328	

[illegible]

WINDSOR HATCHERY

Hatchery brook—	Atlantic salmon fry
Unnamed stream.....	150
Unnamed stream.....	150
Total Distribution.....	300

FLORENCEVILLE HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Atlantic salmon No. 4 finger-lings	Speckled trout advanced fry	Speckled trout No. 1 finger-lings	Speckled trout Older fish (males)
Magaguadavic river—								
Magaguadavic lake.....				10,500				
Miramichi river—								
Bogan brook.....		15,000						
Clearwater.....		15,000						
Elliott brook.....		40,000						
North branch.....		120,000		10,500				
Juniper brook.....							20,000	
Simpson brook.....		15,000						
South branch.....		125,000						
Teague brook.....		20,000						
St. Croix river—								
Palfrey brook.....							25,000	
Skiff lake.....	21,000	54,000						
St. John river—								
Acker brook.....		15,000						
Bath to Beachwood.....				5,500				
Becaguimac river.....	30,000	40,000		10,000				
Davidsons Ferry.....				10,500				
Days brook.....		10,000						
North branch.....	20,000	20,000						
South branch.....		20,000						
Bulls creek.....			25,000				70,000	
Deep creek.....		5,000						
Eel river.....	14,000	10,000	40,000	10,500				
Second Eel lake.....							30,000	
Polowagamis brook.....							40,000	
Rusteen lake.....							25,000	
Florenceville to Bath.....		50,000						
Florenceville to Woodstock.....		10,000						
At Woodstock.....		5,000		11,000				
Geseguit river.....							40,000	
Gibson Mill brook.....		30,000						
Hardwood creek.....		25,000						
Holmesville brook.....							20,000	
Keswick river.....				31,500				
Long creek.....				10,500				
Mactaquack river.....				11,500				
Meduxnekeag river.....		133,000						
Hagerman brook.....							50,000	
Marven brook.....		17,000						
Medutic river.....			20,000					
Medutic to Hatfield Ferry.....				10,500				
Monquart river.....				11,000				
North branch.....	30,000							
South branch.....	45,000							
Nackawic river.....				18,500				
Nashwaak river.....		100,000					60,000	
Ryan brook.....							40,000	
Parent Ferry.....				3,000				
Presquille river.....		125,000						
Brown creek.....		25,000						
Centreville Pond.....								50
Little Presquille river.....		40,000						
Shiktehawk river.....		100,000			4,346			
Little Shiktehawk.....						20,000		
Priests brook.....							20,000	
South branch.....		50,000						
Shogomoc river.....		40,000					50,000	
Stikney brook.....							35,000	
Upham Squires brook.....							2,000	
Whitemarsh creek.....						30,000		
	160,000	1,274,000	85,000	165,000	4,346	50,000	527 000	50

Total distribution..... 2,265,396

GRAND FALLS HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout fry	Speckled trout advanced fry	Speckled trout No. 1 fingerlings
Salmon river—						
Aubin crossing.....		50,000	50,000			
Big bogan.....		75,000	28,000			
Boat landing.....		100,000	75,000			
Covered bridge.....		20,000	25,000			
Davis Mill.....			45,000			
Foley brook.....			150,000			
Little Salmon river.....		100,000	75,000			
Max Cyr Flats.....		50,000	25,000			
Mooney brook.....		75,000	50,000			
Sutherland brook.....			125,000	50,000		
Tom Cote Mill.....		50,000	25,000			
St. John river—						
Andover.....		50,000	125,000			
Argosy brook.....		75,000	75,000			
Aroostock.....			250,000			
Baker lake.....					80,000	20,000
Falls brook—						
Price brook (Vic. Co.).....						10,000
Grand river.....				50,000		
Green river.....						93,612
Hatchery brook.....	6,000	24,700	15,950			75,000
Iroquois river.....						
Indian Ferry.....		50,000	50,000			
Inman Flat.....			55,000			
Kilburn Ferry.....		30,000	25,000			
Limestone siding.....			50,000			
Lower Perth.....			50,000			
Little river.....				50,000		
Beaver brook.....						50,000
Ledges.....						70,000
Morell siding.....		75,000	50,000			
Muniac.....		50,000	125,000			
Nine Mile brook.....				20,000		
Poitras brook.....				10,000		
Powers creek.....						4,500
Quisibis river.....					70,000	500
Rideout brook.....						
River de Shute.....		75,000	25,000			
Salmon river.....			100,000			
Siegas river.....					80,000	
Unique lake.....						40,000
Temiscouata Co. (Que.)						
Plainasse river—						
Round lake.....					10,000	
	6,000	949,700	1,668,950	180,000	240,000	363,612

Total Distribution..... 3,408,262

MIRAMICHI HATCHERY

	Atlantic salmon eyed eggs	Atlantic salmon No. 1 fingerlings
Alberni District—		
Sproat lake—		
Taylor river.....	100,000	
Miramichi river—		
Barnaby river.....		120,000
Bartholomew river.....		60,000
Bartibogue river.....		60,000
Bay du Vin.....		60,000
Black river.....		129,120
Burnt Church.....		60,000
Cains river.....		180,000
Dungarvon river.....		112,000
Renous river.....		180,000
Tabusintac river.....		60,000
Eskedelloe.....		60,000

MIRAMICHI HATCHERY—*Concluded*

	Atlantic salmon eyed eggs	Atlantic salmon No. 1 fingerings
Miramichi river— <i>Con.</i>		
Taxis river.....		120,000
Little South West Miramichi river.....		750,000
North West Miramichi river.....		1,125,000
Millstream.....		184,000
Sevogle river.....		225,000
Stewart river.....		40,000
Trout brook.....		60,000
Wild Cat brook.....		48,000
Northumberland Strait—		
Buctouche river.....		28,000
Cocagne river.....		60,000
Kouchibouguac river.....		56,000
Richibucto river.....		32,000
St. John river—		
Canaan river.....		12,000
Nashwaak river.....		120,000
	100,000	3,941,120
Total Distribution.....	4,041,120	

NIPISIGUIT HATCHERY
(*Subsidiary to Restigouche Hatchery*)

	Atlantic salmon fry
Nipisiguit river—	
Bear Island.....	35,000
Church point.....	40,000
Club House pool.....	45,000
Comeau landing.....	27,000
Gilmore brook.....	40,000
Grilse pool.....	40,374
Knight brook.....	35,000
Long Meadow.....	35,000
Marshall Boudreau beach.....	35,000
Middle beach.....	40,000
Middle landing.....	30,000
Papineau river.....	45,000
	447,374
Total Distribution.....	447,374

RESTIGOUCHE HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings
Chaleur Bay—				
Benjamin river.....		40,000		
Charlo river.....		30,000		
Jacquet river.....		50,000		
Restigouche river.....			6,700	
Chain of Rock to Chamberlain.....		240,000		
Cheaters brook to Toms brook.....		240,000		
Christopher brook.....		50,000		
Cross Point Island.....	250,000			
Glen Emma.....		60,000		
Routhierville.....		60,000		
Walker Island.....	250,000			
Matapedia river—				
Causapsca.....		50,000		
Millstream Falls.....		50,000		
Milnikak river.....		60,000		
Pitts siding.....		50,000		
St. Alexis.....		27,600		
St. Florence.....		60,000		
Upsalquitch river.....	240,000		65,050	
Assamatquaghan.....				9,000
Meadow brook.....				35,000
	740,000	1,067,600	71,750	44,000
Total Distribution.....			1,923,350	

ST. JOHN HATCHERY—Continued

	Atlantic Salmon					Brown Trout				Landlocked Salmon	
	Advanced fry	No. 1 fingerlings	No. 2 fingerlings	No. 3 fingerlings	No. 5 fingerlings	No. 1 fingerlings	No. 2 fingerlings	No. 3 fingerlings	No. 5 fingerlings	Advanced fry	Old fish
Oronocto river (Sturbury Co.)—Con.											
Yoho lake (York Co.)											
Ottawa, Ontario											
Pessamaquoddy Bay—											
Bills lake											
Oreby lake											
Degreguash river (Charlotte Co.)											
Bennie lake											
Hitching brook (Charlotte Co.)											
St. Croix river (Charlotte Co.)—											
Crooks river (Charlotte Co.)											
Green brook (Charlotte Co.)											
Charnook lake (Charlotte Co.)	40,000									48,230	78
Welsh lake											
Dennis stream											
Murtle brook (Charlotte Co.)											
Grand lake (York Co.)	25,000										
Limeburner lake											
Shanags stream											
Soap brook (Charlotte Co.)											
Stein lake											
Rishibucto river—											
Molus river											
St. John river											
Knapikasis river (Kings Co.)	75,000										
Balls lake (St. John Co.)											
Dolan lake											
Gran lake											
Ping Ping lake											
Santon river											
Norfolk river (Kings and Queens Cos.)	50,000										
Potter river (York Co.)											
David lake (York Co.)											
George lake (Glenwood)											
Neagle lake (Harvey)											
Neagle stream											
Salmon river (St. John Co.)	6,777										
Trout creek (Kings Co.)											
Silver lake (Westmoreland Co.)	50,000										
Waverley (Charlotte Co.)											
Bartlett lake (Charlotte Co.)											
Long lake (Charlotte Co.)											
West Harbor											
Big Meadow Brook (Charlotte Co.)											
	530,000	32,552	300	82	2,814	282,835	15,100	3,907	2,301	98,230	78

ST. JOHN HATCHERY

	Lochleven Trout						Rainbow Trout			Speckled Trout				
	Advan- ced fry	No. 2 finger- lings	No. 4 finger- lings	1½ years	Old fish	Eyed eggs	No. 2 finger- lings	Old fish	Fry	Advan- ced fry	No. 1 finger- lings	No. 2 finger- lings	No. 3 finger- lings	No. 4 finger- lings
Bay of Fundy—														
Artificial lake.														
Artificial lake No. 3.														
Artificial lake No. 4.							422	900						
Artificial lake No. 5.								525						
Black river (St. John Co.)								275						
Gardner creek (St. John Co.)														
Other lake.														
Taylor lake.														
Cook lake.											15,000	3,000		
Douglas lake.											15,000			
Hammond river (St. John and Kings Cos.)—											5,000			
Dougherty Lake (Charlotte Co.)											10,000			
Hatchery Reservoir.											10,000			
Henry lake (St. John Co.)											20,000	5,000		
Horrigan lake.											15,000			
Lilly lake (Rockwood Park).											5,000			
Marsh lake—														
Dark lake.														
Mispec stream (St. John Co.)											5,000			
Loch Lomond lake (St. John Co.)											10,000			
Musquash (St. John and Kings Cos.)	46,096	7,551	1,147	3,891	5,528									1,100
New River (Charlotte Co.)									25,000					
Porelogan river (Charlotte Co.)														
Private Pond (H. C. Mott, 13 German St., St. John)												25		
Biological Board, St. Andrews.											250	525	382	
Chignecto Bay—														
Shepody Bay—														
Petitcodiac river (Westmoreland & Albert Cos.)														
Standard lake.														
Bear lake (Charlotte Co.) St. George.								2,602			10,000			
Brooked creek—														
McFadden lake (Albert Co.)														
Kelly's Meadow Brook—														
Clear lake (St. John Co.)												5,000		
Magaguadavic river (Charlotte Co.)														
Bear lake.											15,000			
Bonny river (Charlotte Co.)											10,000			
Cranberry lake (York Co.)											10,000			
Dead water.											15,000			
Harvey lake (York Co.)											10,000			
Lake Utopia (Charlotte Co.)											15,000			
Red Rock lake (Charlotte Co.)											10,000			
Mink lake (York Co.)											5,000			
N. E. Magaguadavic.								350		20,000		3,000		
Trout brook.										40,000	8,000			

ST. JOHN HATCHERY—Concluded

	Lochleven Trout					Rainbow Trout			Speckled Trout						
	Advan- ced fry	No. 2 finger- lings	No. 4 finger- lings	1½ years	Old fish	Eyed eggs	No. 2 finger- lings	Old fish	Fry	Advan- ced fry	No. 1 finger- lings	No. 2 finger- lings	No. 3 finger- lings	No. 4 finger- lings	Old fish
Oronoto river (Sunbury Co.)											20,000				
Three tree creek											10,000				
Yoho lake (York Co.)											40,000				
Ottawa, Ontario						500									
Passamaquoddy Bay— Bills lake															
Cresy lake											10,000				
Digdegush river (Charlotte Co.)											10,000				
Burnie lake											10,000				
Hitching brook (Charlotte Co.)											20,000				
St. Croix river (Charlotte Co.)— Canous river (Charlotte Co.)											10,000				
Green brook (Charlotte Co.)											20,000				
Chamcook lake (Charlotte Co.)											10,000				
Welsh lake															
Dennis stream											10,000				
Murchie brook (Charlotte Co.)											10,000				
Grand lake (York Co.)											5,000				
Limeburner lake											10,000				
Mohanas stream											25,000				
Soap brook (Charlotte Co.)											5,000				
Stein lake											20,000				
Richibucto river— Molus river											10,000				
St. John river— Kennebecasis river (Kings Co.)											20,000				
Balls lake (St. John Co.)											10,000				
Dolan lake											10,000				
Green lake												500			
Ping Pong lake												2,000			
Santon Dam											20,000				
Nerepis river (Kings and Queens Cos.)															
Pokiook river (York Co.)											20,000				
Davidson lake (York Co.)											25,000				
George lake (Glenwood)											20,000				
George lake (Harvey)													1,600		
Nashwakisis stream															
Salmon river (St. John Co.)															
Trout creek (Kings Co.)											10,000				
Silver lake (Westmoreland Co.)															
Waweg river (Charlotte Co.)															
Bartlett lake (Charlotte Co.)											10,000				
Long lake (Charlotte Co.)											10,000				
West Harbour															
Big Meadow Brook (Charlotte Co.)											10,000				
	46,096	7,551	1,147	3,891	5,528	500	422	3,952	25,000	60,000	603,250	19,050	1,982	1,100	2,252

Total Distribution..... 1,754,666

FISHERIES BRANCH

195

TOBIQUE HATCHERY

(Subsidiary to Grand Falls hatchery)

Tobique river.....	Atlantic salmon fry
Tobique forks.....	45,000
Gaunces bogam.....	100,000
Grear flats.....	25,000
Haley brook.....	45,000
Hatchery brook.....	50,000
Millers Main river.....	29,000
Right hand branch of Tobique.....	50,000
Riley brook.....	46,000
Sisson branch.....	75,000
Two brooks.....	25,000
Waters bogam.....	100,000
Total Distribution.....	665,000

KELLY'S POND HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger-lings	Rainbow trout No.2 finger-lings	Speckled trout advanced fry	Speckled trout No.1 finger-lings	Speckled trout No.2 finger-lings	Speckled trout No.3 finger-lings
Bedeque Bay—								
Dunk river—								
Electric light pond.....						20,000		
Dunk river, north branch.....	50,000							
Dunk river, south branch.....		50,000						
Blooming Point Pond—								
McCormick brook.....						10,000		
O'Hara's brook.....						10,000		
Cardigan Bay—								
Brudenell river.....			10,000					
Cardigan river.....	25,000					10,000		
Cascumpeque Bay—								
Lairds pond.....						10,000		
Trout river.....							3,500	
Covehead Bay—								
Black river.....						15,000		
Fortune Bay—								
Fortune river, west branch.....						15,000		
Fortune river, north branch.....		15,000						
Gulf of St. Lawrence—								
East lake.....							3,500	
Goose river.....						10,000		
Naufrage river.....		36,000						
North lake.....						20,000		
Schooner Pond.....	10,000							
Hillsboro river—								
Clarks stream.....						10,000		
Forbes brook.....							5,855	
Hatchery Pond.....								700
Johnson river.....	25,000		15,000					
Sherry's brook.....						15,000		
Malpeque Bay—								
Indian river.....		25,000						
Nimnigash river—								
Green's stream.....						10,000		
Montague river—								
McRae's Pond.....						10,000		
Montague Electric light pond.....						20,000		
New London Bay—								
Hope river.....						10,000		
Stanley river.....						5,000		
North river—								
Coles Pond.....					20,000			
Milton stream.....	15,000							
Northumberland Strait—								
Belle river.....		15,000						
Smelt brook.....						10,000		
Sable river—								
Dixon pond.....						10,000		
Orwell Bay—								
Newton river.....						5,000		
Pictou Harbour—								
Wentworth lagoon.....								1,800
Pisquid lake.....				11,409				
Rustico Harbour—								
Hunter river.....								
Hazel grove.....					25,000			
New Glasgow river.....		15,000						
St. Peters Bay—								
Morell river.....	130,000	50,000	27,653					
Fishers brook.....					11,000			
Gillans stream.....					25,000			
McKennas stream.....						15,000		
Head of Bay.....	15,000							
Midgell river.....			15,000					

MARINE AND FISHERIES

KELLY'S POND HATCHERY—*Concluded*

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
Tignish river—								
Haywood pond.....						7,000		
Round pond.....						10,000		
Tracadie Bay—								
Winter river.....	75,000							
Thompson pond.....					20,000			
Vernon river—								
McMillans pond.....						10,000		
Webber Cove—								
Barbara Weit river.....						10,000		
Wilmot river—								
Clarks pond.....						5,000		
Wheatley river—								
Rackhams pond.....					15,000			
	345,000	206,000	67,653	11,409	116,000	282,000	12,855	2,500

Total distribution..... 1,043,417

GULL HARBOUR HATCHERY

	Pickerel fry	Whitefish green eggs	Whitefish fry
Lake Winnipeg—			
Big island, east side.....	2,500,000		2,550,000
Big island, north side.....	1,000,000		10,000,000
Big island, west side.....			1,500,000
Black island, south side.....	3,500,000		
Black island, west side.....	1,047,000		7,500,000
Deer island, east side.....	1,000,000		4,000,000
Punk island, north side.....			9,000,000
Punk island, south side.....			2,000,000
West shore.....			2,000,000
West shore near Grindstone Point.....	2,000,000		
Berens river.....		375,000	
Pigeon Bay.....		2,850,000	
Berens river and vicinity via C.G.S. Bradbury—			
Between Black Bear and Egg islands.....			1,000,000
H.B. Co's bay.....			1,280,000
Channel island.....			1,250,000
Disboro's dock.....			1,280,000
Flat-head point.....			1,280,000
Flat Head and Helgis.....			1,280,000
Lobstick island.....			1,280,000
McKay harbour.....			1,280,000
McKay island.....			1,280,000
Methodist mission.....			1,280,000
R.C. mission.....			1,280,000
Sandy bar and vicinity.....			1,280,000
Sheep island.....			1,280,000
Clear lake.....	175,000		
Burn's or Olson's lake.....	50,000		
Goose or Roblin lake.....	75,000		
Jackfish or Mitchell's lake.....	150,000		
Killarney lake.....	150,000		
Madge lake, Sask.....	250,000		
Minnedosa lake.....	250,000		
Oddfellows lake.....	75,000		
Pelican lake.....	150,000		
Perch lake.....	125,000		
Red river at Selkirk.....	50,000		
Rock lake.....	150,000		
Round lake.....	125,000		
Sorbo's lake.....	50,000		
Souris lake.....	175,000		
	13,047,000	3,225,000	54,880,000
Total Distribution.....			71,152,000

SWAN CREEK

Pickerel
green eggs

Lake Manitoba—Swan creek and its tributary waters..... 187,340,000

WINNIPEGOSIS HATCHERY

	Pickereel green eggs	Whitefish fry
Lake Dauphin—		
Valley river.....	340,000	
Lake Manitoba—		
Alice point (13 miles from hatchery).....		1,500,000
Lake Winnipegosis—		
Armstrong creek (7 miles from hatchery).....		2,500,000
Chartrand creek.....		1,598,526
Devils island, southeast (30 miles from hatchery).....		2,000,000
Devils island, south-west (30 miles from hatchery).....		3,200,000
Fullers bay—Lunch point (14 to 20 miles from hatchery).....		1,000,000
Hunter island (18 miles from hatchery).....		800,000
Long island (12 to 14 miles from hatchery).....		1,500,500
MacKenzie point (2 miles from hatchery).....		5,000,000
Mossy river, and channel (4½ miles from hatchery).....		1,000,000
North Red Deer point.....		2,000,000
Snake island, east and northeast.....		6,000,000
Snake island, east.....		6,000,000
Snake island, south.....		6,000,000
Snake island, southeast.....		1,500,000
Snake island, southwest.....		1,000,000
The Fishery (14 miles from hatchery).....		3,000,000
Thirty yards from hatchery.....		4,000,000
Waterhen river—		
High island, Reed point (34 to 38 miles from hatchery).....		1,500,000
	340,000	51,099,026
Total distribution.....		51,439,026

FORT QU'APPELLE HATCHERY

	Brown trout No. 1 fingerlings	Pickereel fry	Whitefish fry
Beaver river—			
Makwa lake.....			1,000,000
Cowan river—			
Okemasis lake.....			2,000,000
Hudson Bay lake (not tributary to any other water).....		1,000,000	
Manito lake (not tributary to any other water).....			200,000
Midnight lake—			
Birch lake.....			1,000,000
Milk river—			
Battle creek—			
Adams creek.....	14,250		
Mink creek.....	14,250		
School creek.....	4,750		
Tributary creek.....	4,750		
Moose Mountain Creek—			
Gooseberry lake.....		800,000	
North Saskatchewan river—			
Jackfish lake.....			2,000,000
South Saskatchewan river—			
Elkwater lake (Alta.).....		1,000,000	
Qu'Appelle river—			
Echo lake.....		4,770,000	2,265,000
Katepwa lake.....		5,000,000	1,000,000
Lebret lake.....		2,000,000	734,000
Sioux lake.....		3,000,000	1,000,000
Long or Last Mountain lake.....			2,000,000
Turtle river—			
Turtle lake.....			2,000,000
Whitesand river—			
Cussed creek—			
Wilson lake.....		400,000	
Fishing lake.....		1,000,000	
York lake.....		600,000	
	38,000	19,570,000	15,199,000
Total distribution.....			34,807,000

Upper Vermillion lake.....																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</
----------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

BANFF HATCHERY—Concluded

	Brown trout finger-lings	Brown trout No. 1 finger-lings	Brown trout No. 2 finger-lings	Cutthroat trout fry	Cutthroat trout No. 1 finger-lings	Cutthroat trout Old fish	Lochleven trout No. 1 finger-lings	Lochleven trout No. 2 finger-lings	Rainbow trout fry	Rainbow trout No. 1 finger-lings	Rainbow trout No. 2 finger-lings	Rainbow trout No. 3 finger-lings	Rainbow trout Old fish	Salmon trout No. 4 finger-lings	Speckled trout Old fish
Belly river—															
Waterton river—															
Carpenter creek.....															
Coltonwood creek.....															
Mill creek.....				10,000											
Pine creek.....				10,000											
Trail creek.....				10,000											
Dry Wood creek—															
Yarrow creek.....				10,000							10,000				
Willow creek—															
Brown creek.....									5,000						
Burke creek.....									2,485						
Burton creek.....												5,000			
Honey creek.....															
Nelson creek.....									10,000						
Patterson creek.....															
Quail creek.....									10,000						
South fork.....									15,000					12	
Ottawa, Ontario.....															
Pincher creek.....															
Jack Alexander.....															
Red Deer river.....						2									
Dog Pound creek.....															
Sanson creek.....															
Fallen Timber.....															
Johnson creek.....															
North Bay.....															
South Bay.....															
Beaver creek.....															
Williams creek.....															
Hauling creek.....															
North Saskatchewan river—															
Cow creek.....															
Prentice creek.....															
Trappers creek.....															
South Saskatchewan river—															
Swift current river, Sask.—															
Bone creek, Sask.....															
St. Mary's river—															
Lees creek.....															
Tough creek.....															
Two Jacks lake (no outlet) 8 miles from hatchery.....															
Yoho river—															
Yoho lake.....															
	50,000	80,000		14 1,110,000	12		1	324,700	150,000	177,985	120,000	190,000	77,515	2	12
Total distribution.....															

Total distribution..... 2,280,242

JASPER PARK HATCHERY

Athabasca river—	Speckled trout fry
Medicine lake—	
Maligne lake.....	178,773
Medicine lake creek.....	12,000
Total Distribution.....	190,773

SPRAY LAKES HATCHERY

(Subsidiary to Banff Hatchery)

Rocky Mountain Park—	Cutthroat trout fry
Spray river—	
Spray lake.....	18,000
Bay north of cabin.....	45,670
Bay at outlet.....	20,000
Head of lake.....	92,000
Bryant creek.....	16,000
East side of lake.....	24,000
Marvel lake.....	24,000
Smutts creek.....	8,000
Upper creek.....	52,000
Upper Spray lakes.....	20,000
Total Distribution.....	319,670

WATERTON LAKES HATCHERY

Belly river—	Cutthroat trout fry
Mami creek.....	6,000
Crows Nest river.....	5,000
Allison creek.....	10,000
Burmis creek.....	10,000
Byron creek.....	10,000
Gold creek.....	5,000
Rock creek.....	10,000
Star creek.....	5,000
York creek.....	5,000
Waterton river—	
Cameron creek—	
Carthew lake.....	10,000
Crooked creek.....	6,600
Slough below hatchery.....	200
Total distribution.....	82,800

ANDERSON LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 5 fingerlings
Anderson lake—			
Adlem creek.....		408,000	
Beach 1½ miles from hatchery.....		52,042	
Boulder creek.....		408,000	
Cabin creek.....		204,000	
Cedar creek.....		154,041	
Clemens creek.....	130,000	408,000	
Eight mile beach.....		408,000	
Falls creek.....		408,000	
Granite Beach.....		510,000	
Ternan creek.....		107,797	183
Comox lake—			
Cruikshank river.....	1,000,000		
Great Central lake—			
Drinkwater creek.....	1,442,000		
Polar creek.....	560,000		
Sproat lake—			
Taylor river.....	2,002,000		
	5,134,000	3,067,880	183
Total distribution.....			8,202,063

BABINE LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings
Babine lake—			
Beaver lagoon.....		250,000	
Morrison creek.....			1,478,140
Morrison lake.....		4,681,230	
Salmon creek.....	750,000		
Talho lake—			
Talho creek.....	750,000		
	1,500,000	4,931,230	1,478,140

Total distribution..... 7,909,370

KENNEDY LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 finger- lings	Sockeye salmon No. 3 finger- lings	Sockeye salmon No. 4 finger- lings	Sockeye salmon No. 5 finger- lings	Sockeye and chum salmon old fish (crossed)
Kennedy lake.....		450,000					
Alberni Bay.....		100,000	140,000				
Clayoquot river (upper)....	417,500						
Clayoquot river (lower)....	50,000						
Clayoquot Arm—							
At hatchery.....					20,000		
Beaches.....						18,633	
Cold creek.....	66,500						
Deer Beaches to Narrows			100,000				
Duck Island.....			60,000				
Duck Island to Martin creek.....			101,909				
Martin Creek to Peters Creek.....			200,000				
Martin Creek to Silent Bay.....			25,000				
Fir Creek to Silent Bay..			275,000				
Lake Shore.....				9,000		506	2
Narrows to High Point..			150,000				
Peninsular Bay and Ag- nes Island.....			150,000				
Peninsular Bay to Nar- rows.....			15,000				
Snag Bay.....			75,000				
Ucluelet Bay.....			125,000				
Elk river.....	505,000						
Kennedy river—							
Juanita lake.....	10,000						
Sutton slough.....			75,000				
	1,049,000	550,000	1,491,909	9,000	20,000	19,139	2

Total distribution..... 3,139,050

COWICHAN LAKE HATCHERY

	Atlantic salmon				Coho eyed eggs	Cutthroat trout			Kamloops trout		
	Fry	No. 1 finger-lings	No. 4 finger-lings	No. 5 finger-lings		Fry	No. 5 finger-lings	Year-lings	Eyed eggs	Fry	No. 5 finger-lings
Cameron lake—											
Cowichan river.....											
Cowichan lake.....				3,674					30,000		3,606
Bear creek.....	137,500	3,000									
Beaver creek.....	80,000										
Cottonwood creek.....	57,500										
Lens lake.....	80,000					34,292			45,000		
McKay creek.....					150,000						
Mead creek.....	68,000										
Nixon creek.....	86,000										
Robinson river.....	80,000					25,000					
Shaw creek.....	80,000					25,000					
Sheep creek.....	48,000										
Sutton creek.....	80,000										
Wardroper creek.....					124,380						
Cowichan river.....			396			54,829	2,200				
Green creek.....					100,000						
Oliver creek.....					125,000						
Sahulam lake.....											
Somenos lake.....										21,908	
Holmes creek.....											
Wake creek.....											
Hastings Park, Van. (Aquarium).....											
New Westminster Exhibition.....								8			50
Prospect lake.....						15,000					
Spectacle lake.....											
To Sea—											
Comox lake.....						35,000					
Crystal lake.....										5,000	
Kemp lake.....						15,000					
Matheson lake.....						5,000					
McKay lake.....										5,000	
Quamichan lake.....										25,000	
San Juan Pool.....											
Shawnigan lake.....										65,000	
Stowell lake.....						5,000					
Weston lake.....						5,000					
	883,000	3,000	396	3,674	499,380	219,121	2,200	8	75,000	121,908	3,656

COWICHAN LAKE HATCHERY—Concluded

	Speckled trout						Spring salmon			Steelhead salmon
	Fry	No. 3 finger-lings	No. 4 finger-lings	No. 5 finger-lings	Year-lings	2 yr. olds	Eyed eggs	Fry	No. 2 finger-lings	No. 3 finger-lings
Cameron lake—										
Cowichan river										
Cowichan lake										
Bear creek										
Beaver creek	6,930							313,500		80,000
Cottonwood creek										
Lens lake	500									
McKay creek										
Mead creek							118,000			
Nixon creek	12,000						300,000			
Robinson river	8,000									
Shaw creek										
Sheep creek										
Sutton creek	7,000						118,000			
Wardroper creek										
Cowichan river			1,985			123			159,118	58,959
Green creek					600					
Oliver creek					600					
Sahlam lake	500									
Somenos lake										
Holmes lake										
Wake creek	7,000									
Hastings Park, Van. (Aquarium)	7,000									
New Westminster Exhibition				25			8,000			
Prospect lake		75								
Spectacle lake	8,000									
To Sea—										
Comox lake										
Crystal lake										
Kemp lake										
Matheson lake										
McKay lake										
Quamichan lake										
San Juan Pool										
500										
Shawnigan lake										
Stowell lake										
Weston lake										
	57,430	75	1,985	25	1,200	123	544,000	313,500	159,118	58,959
										163,260

Total Distribution..... 3,111,018

CULTUS LAKE HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Steelhead salmon eyed eggs	Steelhead salmon fry
Harrison lake—				
Hicks lake.....	18,000			
Otter lake.....	10,000			
Hatchery and Sweltzer creeks (Jct.).....			12,083	1,500
Sumas Mt.—				
Devils lake (between Chilliwack and Abbotsford).....		1,894		
	28,000	1,894	12,083	1,500

Total distribution..... 43,477

GERRARD HATCHERY

	Kamloops trout fry
Kootenay lake—	
Lardeau river.....	216,251
Total distribution.....	216,251

HARRISON LAKE

	Sockeye salmon eyed eggs
Harrison lake—	
At hatchery.....	893,965
Morris creek.....	2,650,000
Total distribution.....	3,543,965

LAKELSE LAKE HATCHERY

	Kamloops trout eyed eggs	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 3 fingerlings
Cloyah Inlet—					
Cloyah lake.....	60,000				
Skeena river—					
Lakelse lake.....			4,935,000	450,000	322,500
Angelus creek.....			162,000		
Beaver dam.....			1,906,000	250,000	
Salmon creek.....		200,000	150,000		
Smithers District—					
Buckley river—					
Kathlyn lake.....	70,000				
	130,000	200,000	7,153,000	700,000	322,500

Total distribution..... 8,505,500

LLOYDS CREEK HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Fraser river—		
Bouchie lake (4 miles north of Quesnel).....		20,000
Gulf of Georgia—		
Campbell lake.....	40,000	
Powell lake.....	80,000	
Half Moon Bay lake—15 miles south of Pender Harbour.....		4,000
Isabell lake (east side of Pitt lake).....	10,000	
Japan.....	50,000	
Link lake (Ocean Falls).....	100,000	
North Thompson—		
Birch lake.....	10,000	
Framst lake.....	6,000	
Myrtle lake.....	30,000	
Powder lake.....	8,000	
Okanagan lake—		
Beaver lake.....		10,000
Beaver Jack lake drained by Bassetter and Shuswap into Shuswap lake.....		20,000
Chute lake.....	10,000	
Garnet Valley lake.....		10,000
Island lake.....		10,000
Kalamalka lake—		
Cold stream lake.....		75,000
Paul lake—		
Paul creek.....	165,000	
Shuswap district—		
Shuswap lake—		
Canoe creek.....		10,000
Granite creek.....		60,000
Salmon river—		
Bolean creek.....		100,000
Palmer creek.....		30,000
Eagle river—		
Griffen lake.....	15,000	
Three Valley lake.....	16,000	
Similkameen river—		
Blue lake.....		10,000
Burns lake.....		10,000
McKenzie lake.....		10,000
Round lake.....		10,000
Smelter lake.....		40,000
Tulameen river (Sutter creek).....		10,000
Otter lake—		
Otter creek.....		10,000
Sproat lake (Vancouver Island)—		
Taylor river.....	50,000	
	590,000	449,000
Total distribution.....		1,039,000

NELSON HATCHERY

	Kam- loops trout eyed eggs	Kam- loops trout fry	Kenner- ly's salmon (little Red Fish) fry	Rain- bow trout eyed eggs	Rain- bow trout fry	Speckled trout eyed eggs	Speckled trout fry
Arrow lake—							
Box lake.....	8,000						
Inonaklin river.....							20,000
Lower Arrow lake.....		20,000					
Slocan lake.....		40,000					
Cahill lake.....				20,000			
Bonanza creek—							
Summit lake.....	20,000						
Little Slocan lake.....							20,000
Whatshan lake.....	40,000						
Columbia river.....	100,000						
Big Sheep Creek.....							10,000
Beaver creek.....							10,000
Glenmore lake.....							6,000
Windermere lake—							
Windermere creek.....						40,000	
Cranbrook hatchery—							
Moyle river—							
Swansie creek.....						30,000	
Creston—(Mr. Edmonds)							
Ponds at Creston (80 miles from hatchery)...							1,000
Fernie District—							
Elk river—							
Hartley creek.....						10,000	
Hosmer creek.....						20,000	
McCool creek.....						10,000	
Morrissey creek.....						10,000	
Lizzard creek.....						10,000	
Illecillewat river—							
Moose creek.....						25,000	
Kootenay lake—							
Bear creek.....							10,000
Cottonwood lake.....				85,000			
Cottonwood creek.....					12,000		
Crawford creek.....					20,000		
Goat river—							
Corn creek.....						10,000	
Meadow creek.....						10,000	
Kaslo creek.....						10,000	
Leviathan lake.....							10,000
Lime lake.....							5,000
McGregor lake.....							5,000
Mission creek.....							10,000
Kootenay river.....		29,008				13,142	
Bear creek.....						12,000	
Five Mile creek.....						25,000	
Forty-nine Mile creek.....						37,000	
Grohman creek.....						12,000	
Sand creek.....						12,000	
Six Mile lakes.....				70,000			
Metaline Falls, Washington, U.S.A. (R. H. Yorke)		15,000					
Okanagan lake—							
At Summerland.....			205,000				
Pend D'Or Ile—							
Boundary creek.....						10,000	
Boundary lake.....							50,000
Kettle river.....						10,000	
Christina lake.....	15,000						
North Fork of Kettle.....						15,000	
Smelter lake.....	12,000						
Salmon river.....						10,000	
Headwaters.....							4,065
Similkameen river—							
Ashnola river.....						20,000	
One Mile creek.....							10,000
Tulameen river.....						20,000	
	195,000	104,008	205,000	175,000	143,142	270,000	171,065

Total Distribution.....1,263,215.

MARINE AND FISHERIES

PEMBERTON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon eyed eggs	Sockeye salmon fry
Anderson lake.....				816,000
Gates lake.....				1,360,000
Birkenhead river.....				17,849,000
Francois lake—				
Nadina river.....			5,005,000	
Fraser river—				
Lac la Hache.....	14,000			
Garibaldi lake (55 miles southwest of Pemberton hatchery).....	5,000			
Howe Sound—				
Phantom lake (short distance from town of Britan- nia Beach).....		3,000		
Lillooet lake—				
Adie lake.....				500,000
Alta lake.....		20,600		
Quesnel district—				
Horsefly river.....			3,003,000	
	19,000	23,600	8,008,000	20,525,000

Total distribution..... 28,575,600

PENASK LAKE HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Ellen lake—		
Nicola creek.....	10,000	
Hathiume lake—		
Hathiume creek.....	8,000	
Neveu lake ($\frac{1}{2}$ mile west of Penask lake not tributary to any other water).....	30,000	
Steer lake—		
Steer creek.....	32,975	
Via Summerland hatchery—		
Okanagan lake.....		60,000
Deep lake.....		10,000
Dog lake.....		20,000
Trepanier creek.....		10,000
Vassaux lake.....		20,000
	80,975	120,000

Total distribution..... 200,975

PITT LAKE HATCHERY

	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 3 fingerlings
Upper Pitt river—				
Chas. Peter's slough.....	1,000,000			
Four Mile creek.....	697,003	200,000	130,000	18,170
Four mile slough.....	750,000	200,000	50,000	
Mountain slough.....	1,000,000			
Seven mile creek.....	820,000			
	4,267,003	400,000	180,000	18,170

Total distribution..... 4,865,173

RIVERS INLET HATCHERY

	Sockeye Salmon eyed eggs	Sockeye salmon fry	Sockeye Salmon No. 2 fingerlings	Sockeye Salmon No. 3 fingerlings	Sockeye salmon yearlings
Namu lake—					
Pine creek.....	500,000				
Owikeno lake.....			24,000	24,196	1,990
Askum creek.....	1,001,000	852,700			
Cheo river.....	1,764,000				
Dallick river.....	983,000	780,700			
Genesi creek.....	1,012,000	847,000			
Indian river.....	570,000	746,000			
Meadowse creek (or Hatchery).....	15,000				
Quap creek.....	1,992,000	1,777,200			
Shumahalt Narrows—					
Second Narrows.....		732,000			
Shumahalt river.....	3,008,000	755,000			
Markwell river.....		782,000			
Nookins river.....	489,000				
Wauquash river.....	691,000	721,000			
	12,025,000	7,993,600	24,000	24,196	1,990

Total distribution.....20,068,786

STUART LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry
Stuart lake—		
Alexander lake.....		400,000
Antoine lake.....		85,000
Grass lake.....		947,075
Middle river—		
Hoy creek.....	1,582,000	
Rainbow lake.....		480,000
Waterlily lake.....		510,000
	1,582,000	2,422,075

Total distribution..... 4,004,075

SUMMERLAND HATCHERY

	Whitefish eyed eggs	Whitefish fry
Okanagan River—		
Okanagan lake.....	100,000	820,000
Kelowna.....		400,000
North side of lake.....		2,000,000
Bear creek.....		300,000
Peachland.....		280,000
South side of lake.....		300,000
Trepanier.....		300,000
West side of lake.....		280,000
	100,000	4,680,000

Total distribution..... 4,780,000

APPENDIX IV

SCALLOP INVESTIGATIONS

During 1928 an examination of Mahone bay, Nova Scotia, to ascertain the condition of the scallop beds was made by Mr. Andrew Halkett, Zoologist of the Fisheries Branch, who also carried on exploratory work at Country harbour and Isaac's harbour, Nova Scotia, and off the northwestern part of Prince county, Prince Edward Island. Investigation of a report of the presence of scallops in Minas basin, Nova Scotia, was made by an officer of the Branch, but virtually no evidence to uphold the report was found.

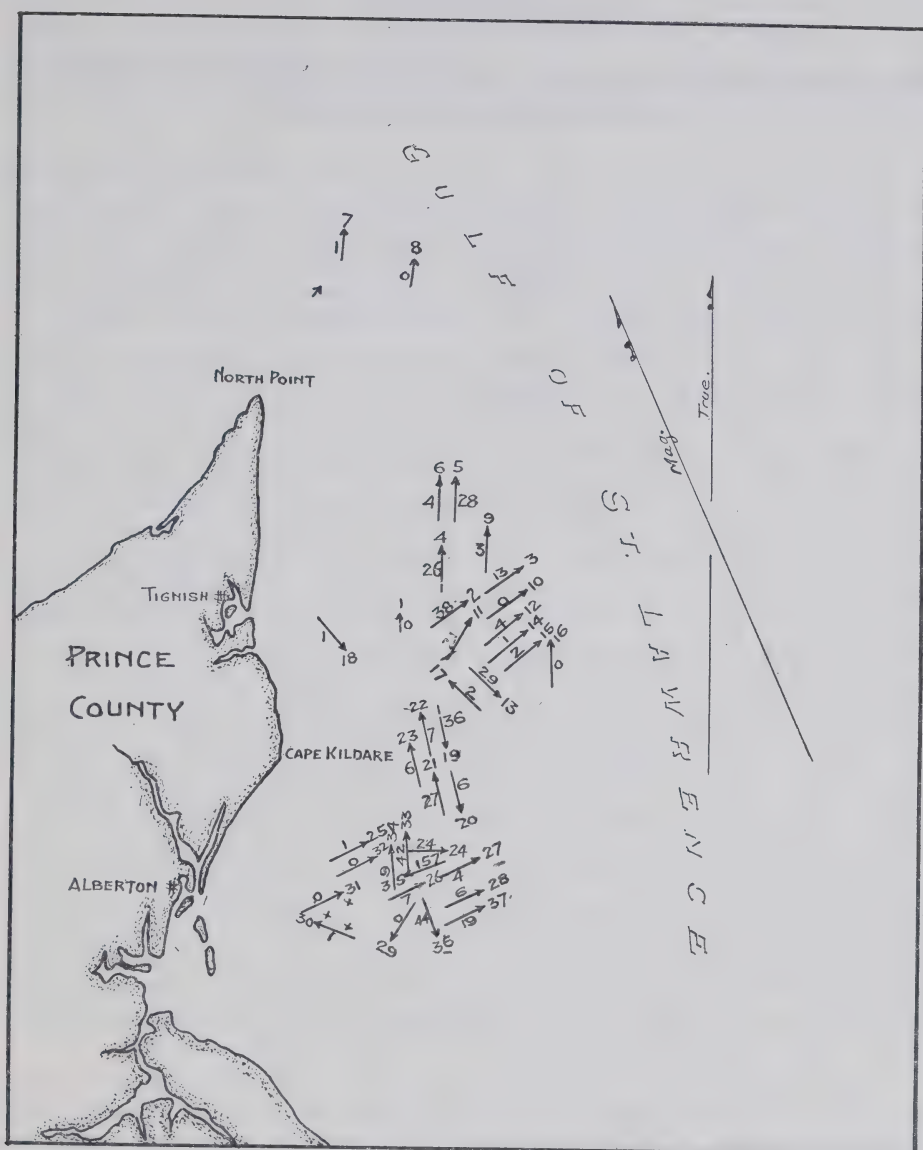
At Mahone bay, Mr. Halkett reported, improvement in the condition of the scallop is steadily gaining. This does not imply that when the entire bay is held in view there is an improvement distinctly visible but there are spots, he reported, where the scallop resource is manifestly recovering, and, notably, spots that made up important fishing areas before the scallop became depleted in these waters. The recovery is slowly extending eastwardly and "in reality it is in general gaining over the entire bay".

At the Country harbour-Isaac's harbour territory dragging was carried on for several days under Mr. Halkett's direction. Very few scallops were obtained and Mr. Halkett reported that the investigation showed no scallop resources of any importance.

The investigation in the gulf of St. Lawrence off Prince county, P.E.I., which augmented a preliminary exploration made in 1927, extended over the period from August 24 to October 2 and established that the best beds in the waters explored are situated off the coast between cape Kildare and Alberton. There are also beds off the coast from Tignish where scallops are obtainable in fair quantity. As a result, Mr. Halkett reported, boats must go off shore from four to seven miles before scallops can be obtained in appreciable numbers. Dragging was done for a total distance of 32,100 yards during the investigation, though operations were hindered by much stormy weather. All told, 569 scallops were obtained in these test draggings. None of them were as large as some which have been found in Mahone bay and other Maritime Province waters—only two of them measured as much as $5\frac{1}{2}$ inches—but a catch brought ashore by commercial fishermen at the opening of the season in October were found by Mr. Halkett to be as fine a lot of scallops as had ever come under his notice. As to spawning, Mr. Halkett found by his investigation that in these waters, as in Mahone bay and elsewhere, scallop spawning occurs in September.

On page 211 is a map on which the draggings done in this investigation are indicated as well as their respective results in catch.

The arrows indicate where draggings were made. The numbers at the heads of the arrows show the sequence in which the draggings took place, and the numbers on the shafts of the arrows show how many scallops were obtained by each dragging. Save in the case of No. 1, No. 7, and No. 8, respectively, the drag was 900 yards in each instance. In the case of No. 1 the distance dragged was 300 yards, No. 7 dragging and No. 8 were each 600 yards.



Plan of the northwestern extremity of Prince County, P.E.I., with the adjacent part of the Gulf of St. Lawrence where exploratory work in locating scallop beds was engaged in from August 24th to October 2nd, 1928.

APPENDIX V

REPORT OF DAVID R. DODGE CONCERNING OYSTER CULTURE IN
PRINCE EDWARD ISLAND

These beds (that is, beds in the area including Bideford river, Grand river, and Richmond bay) are very well located and could be put in shape to yield wonderful crops of oysters, as the oysters seem to grow extraordinarily rapidly in these river beds; in fact it looks to me the greatest need of these oyster grounds is proper cultivation methods. The above-mentioned grounds, with proper methods, could be made to yield almost unlimited amounts of oysters.

There are a large number of acres in the vicinity of Richmond bay that I sounded out, and some which I staked and worked, and this ground I found to be hard and level. There are also large areas of oyster ground from Oyster creek along the shore and at Beach point all the way to Curtain island. I staked and worked with the dredges two pieces of above 120 acres and one of 20 acres at Curtain island. Part of this ground is of very fine quality, and there is a part of it that was coated over with oyster shells. There seemed to be a coat of about four or five inches deep on one piece of sixty acres, which shells were caught with the *Ostrea* and put on the docks at lot No. 14 and Malpeque; 1,100 bushels were taken off the dock at lot No. 14 for spawn collecting purposes. These 1,100 bushels were planted at the narrows, at Indian island, Grand river (upper bridge), the Gillis point bridge and above Southwest bridge; and also at below the bend at Grand river near Southwest bridge. On the shells planted above the Southwest bridge an excellent set was obtained. Some of the shells had as high as sixty young oysters on them, which grew exceedingly well, and looked to be excellent. I transplanted these sets from above the Southwest bridge on to a piece of ground I had staked for them at Gillis point. The depth of the water there was six and one-half feet at low tide, and this location appeared to me to be a perfect locality to "winter" these young oysters. The oysters that were bought were planted beside the sets already mentioned at Gillis point, inshore, and south of the same piece, which is of the same depth of water. There were two lots of these purchased oysters; one of seventy barrels from Mount Stewart and one of thirty barrels from Mr. Noyes, the latter being two-year-olds. I looked all around Richmond bay and the rivers and inlets nearby, and Gillis point ground appeared the best locality obtainable.

There is a large tract of hard bottom in about twelve feet of water all along the shore near Bendix cove. There is one long reef of rocks running nearly through this ground. I think that within three years of proper cultivation and care all of this ground could be made to yield fine crops, as it all seems to be naturally adapted to oyster growing. The rivers would produce much larger crops per acre than the bay, as the rivers would grow the oysters much faster.

With the spawners now on hand, there should be a splendid set on all the shells now on the docks at Grand river and Malpeque, as they will be in perfect condition for another season.

The real needs are a proper oyster boat and a good-sized power tender to carry shells and seed up and down the rivers and creeks. This oyster boat should be about fifty feet in length and be equipped with a fifty-horsepower gasoline engine and not draw over four and one-half feet of water, which would permit operation on all the small beds in the rivers, which is now impossible with the *Ostrea*. A boat of this description would pay for itself in one season, from the proceeds gained by the increase of growth due to transplanting, for which no provision is made at present.

These bays and rivers have such nice clear, pure water that they should raise a quality of oysters that would demand the very highest market price.

APPENDIX VI

REPORT OF C. BRUCE, A.M.E.I.C., FISHERIES ENGINEER

Under the classification "Clearing Rivers and Building Fishways" the policy of the department to extend this work as opportunity and conditions permitted was continued throughout the year. Gratifying results were apparent in many instances where work had previously been done, possibly the outstanding example of this being the Mersey river in Nova Scotia. Fishways were installed in five dams on this river in 1923 to overcome obstructions which had prevented the ascent of fish. During the season of 1928 the catch by anglers exceeded 1,600 salmon, and reports from officers of the department stated that during the summer there were large numbers in the river.

The development of rivers throughout Canada for hydro-electric and other utilities is assuming much larger proportions. The centralization of such developments for the purpose of providing large blocks of power, which may be distributed to supply extensive districts, has led to the construction of dams much greater in height than was formerly the case. Many of these developments provide problems in connection with the ascent of fish over the dams as well as the adequate protection for their descent to the sea which have yet to be solved.

A general inspection covering the works contemplated during the season was made and the following were undertaken:—

NOVA SCOTIA

Barrington River, Shelburne County.—Screens were installed at the outlets of the tailrace channels from the woollen mill and electric lighting dams to prevent the ascent of salmon and direct them into the main river channel where they could ascend the fishways.

Roseway River, Shelburne County.—Fishways in the first three dams from the mouth of the river were repaired and enlarged.

Clyde River, Shelburne County.—The fishway at the Queens dam was repaired, and at several points between the head of tide and this dam, a distance of about one mile, where shallow bars occurred, channels were opened to permit the passage of fish during low stages of water in the river.

Green Harbour River, Shelburne County.—Work in connection with deepening channels over shallow portions of the river bed to facilitate the ascent of salmon was completed during low water in the summer.

Broad River, Queens County.—The fishway in the dam at the mouth of the river was enlarged and improved.

Mersey River, Queens County.—Due to a greater usage of water by the power plant operating for electric lighting, conditions at the fishway in the dam connected therewith became unsuitable for the passage of salmon, and it was necessary to enlarge and extend it to meet this condition. Wire fencing was erected around three fishways to prevent access thereto by poachers.

Lequille River, Annapolis County.—A wire screening was placed across the forebay of the Town of Annapolis Electric Power plant to prevent the destruction of young salmon when descending the river.

Nictaux River, Annapolis County.—The old wooden fishway in the C. S. Roger's dam, which was only partly effective, was replaced by a modern concrete fishway. The work was done by contract.

Porters Lake, Halifax County.—The outlet of this lake, which is directly into the ocean, is subject to filling in by heavy storms, thereby preventing the entrance of smelts and gaspereaux, which provide a remunerative fishery. The channel became blocked during the summer and it was necessary to provide an opening.

Ship Harbour River, Halifax County.—A concrete fishway was built in the John Lewis dam near the mouth of the river.

Osier River, Halifax County.—Designs were furnished to Messrs. Hubley and McDonald, who built a fishway in their dam on this river.

Shinimicas River, Cumberland County.—A fishway was built in the John Smith dam on this river, and an opening made in an old unused dam. Evidence was secured that salmon ascended the river during the fall run.

Little Salmon River, Halifax County.—Designs were furnished to the owner, J. C. Shaw, for a fishway in his dam on this river.

Moose River, Colchester County.—Designs were furnished for a fishway in a dam to be built on this river.

Morrison's Pond, Victoria County.—A passage for fish was opened to the Bras d'Or lakes.

Trout Brook, Inverness County.—A channel was opened through the bar at the mouth of the brook to facilitate the passage of trout.

In several instances where obstructions had formed in streams which prevented the passage of trout and salmon they were removed, the following streams being dealt with: McInnes brook, McLennans brook, Inverness county; and Murphy brook, McKinnon brook, Richmond county.

NEW BRUNSWICK

Magaguadavic River, Charlotte County.—A contract was awarded for the construction of a fishway over the falls at the mouth of the river and work proceeded throughout the summer. The fishway was advanced to approximately seventy-five per cent of completion when owing to high water it was necessary to abandon it until the following year.

Mispec River, St. John County.—The construction of a fishway was undertaken to connect with the gate opening through a large stone dam at the mouth of the river.

Becaguimac River, Carleton County.—A fishway was built in the John Sayre dam on this river to facilitate the ascent of salmon.

PRINCE EDWARD ISLAND

Morell River, Kings County.—The fishway in Laird's dam on this river was repaired to make it more effective.

MANITOBA

St. Andrews Locks, Red River.—Designs were prepared and submitted to the Department of Public Works for modifications to the partitions of the fishway in the dam at the locks.

Whitemud River.—Designs were prepared and submitted to the provincial Public Works Department for a fishway in the Galloway dam on this river.

SASKATCHEWAN

Moose Jaw Creek.—Designs were prepared for fishways for the Pasqua dam owned by the Canadian Pacific Railway and for the high-pressure dam owned by the city of Moose Jaw, and submitted to the owners for execution of the works.

ALBERTA

Beaver Creek.—A design was prepared for a fishway in a dam on this creek owned by Johnson Brothers.

BRITISH COLUMBIA

Work removing obstructions to the ascent of salmon under the direct supervision of the engineers was performed on the following streams: Black creek, North bay and Cecilia creeks, Alouette river, Big Qualicum river, Marble creek, Salmon river (lower mainland), Salmon creek (Babine lake), 103rd creek, Oyster creek, Wilson creek, Rupert Arm creek (Main river), Bulkley river.

This work in general embraced the removal of log jams and rock obstructions, which either hindered and delayed the passage of salmon to their spawning grounds or else entirely prevented such passage.

In addition to the above, minor obstructions were removed under the supervision of the local overseers. In these instances, where the expenditure is only small, it is the custom, unless engineering advice is necessary, to instruct the local overseer or guardian to do the work, thus obviating considerable expense for travelling. The following streams received attention: Gates lake and creek, Johnson river, Koeve river, Deer creek, Little river, Birkenhead river, Hobarten river (Nitinat Arm), Bush creek, Bear creek, Blaney creek, Koprino river, Dena river, Royston creek, Carrington bay, Johnson creek, Stoney creek, Sucker creek, Nicomekl river, Sidney Inlet creek, Esperanza Inlet creek and Kis-suck-kis creek.

Stamp Falls Fishway.—During the construction of this fishway the previous year the water continued so high that the lowest step and pool could not be completed. The work was successfully carried out and the fishway entirely cleared of accumulations of rock which had been carried in by winter freshets.

Solloway Creek.—Designs were prepared for a small fishway in a timber dam.

Under the classification "Fish Culture" the following works were undertaken during the year:—

NOVA SCOTIA

Yarmouth Hatchery.—Designs were prepared and a contract awarded for the construction of a complete hatchery establishment at the outlet of lake George, Yarmouth county.

The hatchery building is seventy-four and one-half feet long by thirty-eight feet wide, and provides accommodation for forty standard hatching troughs each sixteen feet long, as well as sixteen floor tanks each fourteen feet long by twenty-four inches wide. Provision is made as well for two living rooms for the staff, an office, feed room, ice storage, coal room and storage space for equipment.

The dwelling is thirty feet square, containing seven rooms and bathroom, and a double garage is provided.

The rearing pond system consists of twelve ponds, each 150 feet long by 5 feet wide, constructed with reinforced concrete side walls and gravel bottoms.

The water supply is provided by a reinforced concrete dam at the outlet of lake George, with an eight-inch wood stave pipe to the hatchery and a twelve-inch pipe to the rearing pond system.

The dwelling is equipped with sanitary plumbing, heated with a hot-air furnace, and all buildings throughout are lighted with electricity developed by a gasoline-operated plant.

Antigonish Hatchery.—A hatchery establishment similar to that provided in Yarmouth county was built in Antigonish county at Fraser's Mills on the South river.

The rearing pond system consists of twelve ponds, each 115 feet long by 5 feet wide, constructed with concrete side walls and gravel bottoms.

The water supply is obtained from the South river, where a concrete dam, equipped with a fishway, was built. A twenty-inch wood stave pipe conducts the water from the dam to the hatchery and rearing pond system.

Margaree Hatchery.—A new ten-inch wood stave pipe, eleven hundred feet long, was laid from the water supply to the hatchery to replace two six-inch wrought iron pipes, which had become so corroded that they would not provide an adequate supply. The dam for the water supply, which had been seriously damaged by freshets, was thoroughly repaired.

Bedford Hatchery.—A new ten-inch wood stave pipe was laid from the water supply in the Sackville river to the hatchery to augment the volume required.

NEW BRUNSWICK

Florenceville Hatchery.—The remainder of the rearing pond system, uncompleted last year, consisting of three ponds each 126 feet long by 5 feet wide, was built. This system now contains eight ponds of the above dimensions.

MANITOBA

Swan Creek Hatchery, Lake Manitoba.—Sites for a hatchery for the propagation of pickerel having been inspected, the department approved of one at Swan creek, an inlet on the easterly side of lake Manitoba, near the town of Lunder.

Designs were subsequently prepared and a contract for the construction of a hatchery completed. The building is fifty-seven and one-half feet long by thirty-one and one-half feet wide, containing two batteries providing a capacity of 312 hatching jars. Living accommodation for the staff consists of three rooms. A steam boiler and duplex pump were installed to provide water for the operation of the hatchery.

SASKATCHEWAN

Qu'Appelle Hatchery.—In order to provide for the propagation of trout at this hatchery, a portion of the whitefish battery and the inside floor tank were removed. In the space gained thereby twenty-four standard dimension troughs, each ten feet long, were installed. Two whitefish fry tanks, each ten feet by twelve feet, were built outside the hatchery to take the place of the floor tank.

An addition eight feet by twenty-two feet was built on the garage building to provide stable room.

ALBERTA

Lesser Slave Lake Hatchery.—The contract for this hatchery was completed early in the year, after which the installation of machinery was undertaken, the plant consisting of two steam boilers and two duplex pumps arranged so that either boiler may be used with either pump.

Owing to the difficulty that has been met with in northern climates in protecting the intake pipe from frost, which has on some occasions resulted in the pipe being broken even when laid to a considerable depth, a method designed to prevent this was adopted.

The intake, which is a six-inch wrought iron pipe, about 400 feet long, was laid from the hatchery encased inside a twelve-inch diameter wire wound wood stave pipe for a distance of 300 feet, or sufficient so that the outer end of the casing would be submerged in the lake below ice level, the land portion of the pipe being placed in excavation. The waste water from the operation of the hatchery is discharged through the wooden casing so that the intake is continuously surrounded with water slightly above freezing temperature due to its circulation through the hatchery. In the event that frost penetrates to the pipe, any movement which may occur is taken up by the casing, thus preventing a rupture of the intake.

The heating system for the hatchery and apartments on the second floor was installed, the entire system being supplied by the exhaust steam from the pumps, with an emergency connection for live steam.

A wharf, 400 feet long, was built out from the shore of the lake, consisting of three sections, the first or shore section being cribwork, 110 feet long by 20 feet wide, the second section pile trestle work with decking for a length of 220 feet, and the outer section cribwork seventy feet long by twenty feet wide, with a twenty-foot by twenty-foot ell at end to afford protection for the hatchery boats. A well was provided in the outer section from which the water supply for the hatchery is pumped, thus affording a measure of filtration.

Designs were prepared and contracts completed for two gasoline launches for use at the hatchery, the larger being forty-five feet long and the smaller thirty feet long. The smaller boat is fitted with tunnel stern and raising propeller for use in shallow water and in connection with nets.

BRITISH COLUMBIA

Lakelse Lake Hatchery.—The spawning fence at Williams creek, badly secured by winter freshets, was completely replaced and the bank of the river adjacent protected with cribbing.

Pemberton Hatchery.—Part of the foundation and floor of the hatchery were renewed.

Babine Lake Hatchery.—The foundation and lower logs of the mess house and outhouse were renewed and the interior of the mess house lined with three-ply cottonwood panelling.

Stuart Lake Hatchery.—The entire roof of this establishment was re-shingled.

Harrison Lake Hatchery.—New posts were set to prevent the collapse of the hatchery building which, owing to rotting of foundations, was in a precarious condition. Estimates were also completed for the complete reconditioning of the hatchery. Later, in order to accommodate surplus eggs, the hatchery was equipped with fifty new troughs, a head tank and water supply.

Cowichan Lake Hatchery.—A new boat-house, measuring twenty feet by thirty feet, was built.

In addition to repair work, surveys were made for the purpose of securing the necessary data in connection with the establishment of two proposed eyeing stations: one at Blackwater creek, Pemberton district, and one at Penask lake, Okanagan district.

Taft, B.C.—Plans were prepared and the construction of three fry ponds undertaken under the supervision of the engineers.

The ponds each measure sixty feet long, sixteen feet wide, and three feet deep, with a centre partition forty feet long, designed so that the water enters at the upper end and after flowing the length of the pond on one side of the partition, returns to a discharge at the same end on the other side of the partition.

The ponds are built of two-inch fir, with slip tongue joints, with the requisite sills and posts.

The water for the ponds is obtained from the supply of an abandoned mill site at Taft, permission having been obtained to connect with the old water mains from the owners and from the Canadian Pacific Railway Company, who have prior rights to the water system for tank purposes.

BIOLOGICAL STATIONS

Departure Bay, B.C.—Two salt-water tanks were installed, constructed of heavy galvanized iron wire with galvanized angle iron frames set between log floats and arranged to rise and fall with the tide between creosoted piles.

A fire protection system consisting of a gasoline pump, pipe lines and hydrants to the various buildings was installed.

A hot water heating system was installed in the old biological building.

Designs were prepared and contract completed for a new residence building. The building is laid out forming an ell, the main part measuring forty-two feet by forty-six feet, and the wing fifty and one-half feet by twenty-five feet.

The basement under main building contains a large dining room, furnace room and various storage rooms. The main floor provides the several living rooms and the upper floor is entirely bedrooms. The wing can be entirely closed off in the winter when assistance at the station is reduced to the minimum. The building is heated with hot water, lighted with electricity and piped throughout for fresh water.

Marine Laboratory, Eastern Passage, N.S.—A contract was awarded and the construction of the building in connection with this establishment completed.

INVESTIGATIONS

Hell's Gate and Bridge River Rapids, Fraser River.—The investigations which had been carried on at these points by the Board of Engineers, appointed for the purpose, have, for the time being, been completed and reports covering both situations were submitted. Daily reading of the water heights are being maintained at the two gauges at Hell's Gate.

Shuswap River Falls.—Investigation was made into the feasibility of providing a fishway for a dam seventy feet in height at this point. As a result of these investigations it was ascertained that the passage of salmon could not be assured and under the circumstances it was recommended that the construction of the fishway be not required.

Nimpkish River.—Proposals in connection with the development of electrical energy on this stream by the construction of a dam 200 feet high were given careful study, as the importance of the fisheries at this point demand that the question of a fishway be given every consideration. The actual construction of the project has not yet been commenced.

Investigations were made of obstructions on the Yakoun river and Queens cove, and of the falls on the Buckley river, with a view to remedying unfavourable conditions for the ascent of salmon.

Dexter P. Cooper Project.—Investigation was made into the probable effects on the fisheries of the proposed installation of dams across the mouth of Passamaquoddy bay and report submitted to the sub-committee of the North American Committee on Fisheries Investigations.

GENERAL

Considerable numbers of plans for equipment and maps relating to the fisheries were prepared during the year.

APPENDIX No. 7

FISHERIES

FINANCIAL STATEMENT, 1928-29

Vote No.	Service	Appropriation		Expenditure	
		\$	cts.	\$	cts.
238	(Salaries and disbursements, F.O.....)	950,000	00	949,922	70
	{ Fisheries Patrol Service.....}				
	{ Fisheries Protection Service.....}				
239	Building fishways, etc.....	20,000	00	19,275	46
240 and 487	Legal and incidental expenses.....	6,000	00	5,203	95
241	Conservation and development of deep sea fisheries.....	130,000	00	113,582	73
242	Fisheries Intelligence Bureau.....	1,000	00	743	42
243	Inspection of pickled fish.....	30,000	00	28,069	67
244	Fish culture.....	442,000	00	434,471	58
245 and 491	International Fisheries Commission (Halibut) . . .	31,500	00	36,419	29
246 and 488	Marine Biological Board	200,100	00	200,100	00
489	Oyster culture.....	10,000	00	9,921	34
490	Hair seal bounty.....	25,000	00	24,997	00
		1,845,600	00	1,822,707	14
16 and 414	Civil Government salaries.....	121,080	00	100,694	04
16	Contingencies.....	25,000	00	24,968	85
stationary	Fishing bounty.....	160,000	00	151,411	20
		2,151,680	00	2,099,781	23
	Miscellaneous—				
	Gratuities.....			440	00
				2,100,221	23

STATEMENT OF REVENUE RECEIVED DURING FISCAL YEAR 1928-29.

Class	Total	General account	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Fisheries revenue.....	110,420 33	.....	11,363 25	2,700 50	11,177 45	.....	23,332 50	8,136 00	17,869 50	35,426 13	415 00
Fines and forfeitures.....	14,173 42	.....	904 53	683 65	2,639 64	.....	1,458 58	932 01	1,219 38	6,325 63	.....
Modus Vivendi.....	365 00	.....	.....	.....	.....	.....	.....	.....	.....	365 00	.....
Casual revenue.....	8,134 71	4,707 92	549 10	62 30	196 93	192 70	60 75	57 84	130 49	2,176 66	.....
Fish culture revenue.....	638 94	.....	.....	4 80	323 63	.....	5 40	53 11	.....	252 00	.....
Pelagic sealing treaty.....	73,236 35	73,236 35	.....	.....	.....	.....	.....	.....	.....	.....	.....
Premiums, discounts and exchange.....	312 30	311 05	.....	.....	.....	.....	.....	.....	.....	1 25	.....
Totals.....	207,281 05	78,255 32	12,816 88	3,451 25	14,337 67	192 70	24,867 23	9,178 96	19,219 37	44,546 67	415 00

Refund of fees received prior to 1928-1929.....\$ 1,120 10

Refund of Casual Revenue received prior to 1928-1929.....\$ 6 60

\$ 1,126 70\$206,154 35

SUMMARY

Provinces	Totals	Inspectors, Overseers and Wardens		Allowances				Gasolene and oil	Special Guardians		Sundry	
		Salaries	Disburse- ments	Auto	Boat	Horse	Wages		Expense			
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
Nova Scotia.....	136,252 02	68,782 81	13,641 27	11,349 46	1,300 00	229 32	177 77	36,833 19	815 45		3,122 75	
Prince Edward Island.....	19,630 13	11,460 00	2,681 28	1,748 50	150 00		122 94	2,738 70	502 43		226 23	
New Brunswick.....	88,103 48	37,444 85	6,551 71	5,796 10	1,625 09		1,062 18	34,015 26	970 02		633 27	
Quebec.....	128 94		128 94									
Manitoba.....	21,510 94	9,874 00	3,667 15	600 00	600 00	875 00	247 98	2,878 19	2,597 97		170 :	
Saskatchewan.....	21,891 59	11,141 61	3,856 95	1,200 00	168 75	750 00		1,843 75	2,777 88		152 65	
Alberta.....	23,768 30	11,679 19	4,290 93	1,275 00	400 00	600 00	149 54	3,098 00	2,180 65		94 99	
British Columbia.....	135,462 51	61,962 31	26,761 27					23,615 98	10,540 65		12,582 30	
General Account.....	13,105 16										13,105 16	
Totals.....	459,853 07	212,344 77	61,579 50	21,969 06	4,243 84	2,454 32	1,760 41	105,023 07	20,385 05		30,093 05	

EXPENDITURE 1928-29
DETAILED STATEMENT OF FISHERIES PATROL SERVICE

Establishments and Accounts	Total Dr.	— \$ cts.	Pay-list \$ cts.	Board or Pro- visions	Fuel	Repairs		Supplies			Clothing	Sundry
						Hull	Engine	Engine	Deck	Stewards		
NOVA SCOTIA—												
F.P. No. 1.....	5,041 58.		2,811 22	150 00	439 91	140 74	1,203 71	139 96	68 93	102 35	9 24	124 02
Mildred McColl.....	6,012 43	11,054 01	4,480 97		506 07	197 75	27 95	315 05	145 12	106 56	51 11	181 85
Lulu T. (Chartered).....	1,752 20	1,752 20	532 69		107 63			13 91		1 20		1,096 77
	12,806 21.		7,824 88	150 00	1,053 61	338 49	1,231 66	468 92	214 05	210 11	60 35	1,402 64
PRINCE EDWARD ISLAND—												
Richmond.....	1,535 17	1,535 17	1,059 14		245 37	74 14	33 18	45 82		14 30		63 22
Chartered Boats—												
Blake.....	1,566 25		1,006 47									559 78
Crystal.....	806 44		606 44									200 00
Dora.....	403 22		303 22									100 00
Flying Cloud.....	403 22		303 22									100 00
Gander.....	695 17		445 17									250 00
Ostrea.....	8,260 54		657 01	220 70	803 08	3,191 19	2,165 53	363 28	184 31	29 44	53 10	592 90
Retriever.....	871 09		561 30									309 79
Sea Gull.....	396 78		296 78									100 00
Spy.....	396 78		296 78									100 00
Vinny R.....	877 63	14,677 12	638 06									219 57
	16,212 29		6,193 59	220 70	1,048 45	3,265 33	2,198 71	409 10	184 31	43 74	53 10	2,595 26
NEW BRUNSWICK—												
Gannett Rock.....	4,592 93		2,905 00		269 57	17 52	909 09	509 65	55 27	51 40		145 43
Phalarope.....	6,590 33	11,543 26	5,190 00		773 50		94 36	354 13	64 20	73 55	25 59	15 00
Chartered Boats—												
Lloyd George.....	314 76		215 00		8 80						15 96	75 00
Norge.....	1,286 28		299 00		160 49			20 08	2 31			804 50
Pontiac.....	4,065 77	5,666 91	1,532 00		504 04			16 91	2 32			2,010 50
	17,210 17		10,231 00		1,716 40	17 52	1,003 45	900 77	124 10	124 95	41 55	3,050 43
MANTOBA—												
Bradbury.....	22,080 03		10,158 08	2,921 93	6,237 31	774 48	77 70	415 87	1,091 29	125 89	691 00	186 48
BRITISH COLUMBIA—												
General Account.....	34,666 35	34,666 35	7,012 04	50 87	73 32	119 06	384 35	108 28	50 00	0 68	1 50	26,886 25
Poplar Island Warehouse.....	2,189 76	2,189 76	1,306 66		87 85	19 65	10 80	194 01		18 20		552 59

Departmental Boats—

District No. 1—

Elkhorn.....	2,952 68	2,326 38	6 00	406 65	13 75	53 62	36 22	17 70	69 47	4 79	18 10
Foam Crest.....	5,163 78	4,500 00	.....	372 75	8 25	82 86	16 25	38 23	58 91	25 97	60 56
Hummingbird.....	8 95	.....	.....	3 15	.....	3 50	2 30	.....	.....	.....	.....
Merrysea.....	5,854 90	4,490 75	456 40	97 39	103 02	65 44	184 41	130 15	80 71	15 00	231 63
Swan Tail.....	4,033 26	3,344 19	.....	491 35	0 85	56 23	40 86	13 20	24 99	4 96	56 63
Vedder River.....	3,432 67	2,975 00	.....	271 60	13 75	33 27	35 29	19 95	60 55	4 46	18 80
District No. 2—											
Babine No. 1.....	930 51	700 00	.....	73 85	14 65	7 25	31 26	30 00	0 80	.....	72 70
Babine No. 2.....	907 47	695 48	.....	113 23	27 96	6 57	29 61	2 80	4 32	.....	27 50
Beldis.....	4,651 75	2,453 00	36 85	1,024 30	55 30	45 01	304 00	78 82	207 78	10 09	436 60
Bonila Rock.....	3,778 75	2,306 41	.....	502 59	73 50	523 36	184 56	88 15	72 28	.....	27 89
Cloyah.....	2 60	.....	.....	2 60	.....	.....	.....	.....	.....	.....	.....
Hawk Eye.....	1,656 29	1,284 67	.....	242 51	3 95	24 75	65 20	10 00	20 95	.....	4 26
Heron Wing.....	4,528 03	2,932 09	4 33	701 49	65 85	515 06	86 29	125 20	66 78	9 82	21 12
Linnett N.....	36 40	.....	.....	23 23	.....	9 85	3 32	.....	.....	.....	.....
Marlish.....	744 93	391 27	26 00	28 70	.....	251 02	.....	.....	.....	.....	.....
Metra.....	4,820 64	2,841 54	393 34	829 90	90 80	355 06	159 12	30 15	91 10	5 47	37 47
Rivids.....	5,299 91	2,908 29	780 53	471 01	141 70	338 39	228 26	82 73	152 55	42 02	124 43
Senepa.....	5,212 33	2,381 61	32 64	1,594 41	55 14	115 58	323 25	73 86	201 43	.....	434 41
District No. 3—											
Black Raven.....	2,624 18	1,245 96	.....	253 39	30 86	323 53	339 48	59 91	103 65	32 60	234 80
Egret Plume.....	4,621 58	1,959 68	.....	273 28	462 80	2,628 50	73 56	28 16	112 50	.....	83 10
Gull Wing.....	2,699 55	1,500 00	.....	127 73	240 39	445 52	216 29	7 45	50 99	23 54	87 64
Pursepa.....	3,655 45	1,500 00	.....	1,029 32	61 52	80 01	184 55	176 70	126 96	22 19	474 20
Vanidis.....	9,673 88	6,480 00	1,154 47	325 00	52 25	343 29	709 74	47 99	338 60	81 57	140 97
Chartered Boats—											
District No. 1—											
Betty.....	1,232 41	823 23	.....	50 70	.....	.....	31 31	.....	3 28	.....	323 89
Eva.....	958 00	658 94	.....	46 72	.....	.....	0 45	.....	.....	.....	251 89
Jean No. 2.....	528 62	344 52	.....	68 00	.....	.....	12 10	104 00	.....	.....	452 00
Mincta.....	504 42	305 81	.....	102 00	.....	.....	10 11	.....	.....	.....	994 00
Porteous.....	240 00	240 00	.....	.....	.....	.....	.....	.....	.....	.....	1,145 00
Sealey.....	185 81	185 81	.....	.....	.....	.....	.....	.....	.....	.....	55 16
W.T.C.....	1,951 63	1,309 35	.....	45 62	0 40	.....	9 76	.....	.....	.....	882 50
District No. 2—											
Amy S.....	660 11	250 88	.....	71 38	.....	.....	45 81	.....	3 04	.....	869 00
Argo.....	59 59	0 32	.....	0 32	.....	.....	59 27	.....	.....	.....	64 96
Bee.....	948 80	424 76	.....	57 04	.....	.....	10 80	.....	4 20	.....	1,034 45
Biddy K.....	2,026 23	950 82	.....	81 41	.....	.....	.....	.....	.....	.....	1,938 00
Brant.....	2,581 17	913 61	.....	444 95	.....	.....	72 95	.....	4 66	.....	682 11
Cutty Sark.....	93 03	.....	.....	28 22	.....	.....	9 65	.....	.....	.....	1,375 00
Doris J.....	2,127 73	875 81	.....	310 16	.....	.....	49 26	.....	.....	.....	.....
Double A.....	1,955 00	802 50	.....	235 93	.....	.....	44 53	.....	3 04	.....	.....
D.W.....	82 92	.....	.....	17 15	.....	.....	0 81	.....	.....	.....	.....
Elida.....	2,283 66	928 47	.....	238 67	.....	.....	78 01	.....	4 06	.....	.....
Eureka.....	2,176 83	983 22	.....	227 18	.....	.....	25 31	.....	3 12	.....	.....
Fisher.....	1,785 51	795 09	.....	259 67	.....	.....	41 98	.....	6 66	.....	.....
Flying Spur.....	2,927 53	1,107 10	.....	324 90	.....	.....	116 03	.....	4 50	.....	.....

[illegible]

DETAILED STATEMENT OF FISHERIES PATROL SERVICE—Concluded

Establishments and Accounts	Total Dr.	—	Pay-list	Board or Pro-visions	Fuel	Repairs		Supplies		Clothing	Sundry
						Hull	Engine	Engine	Deck	Stewards	
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
BRITISH COLUMBIA—Con.											
(Chartered Boats—Con.											
District No. 3—Con.											
Speedwell.....	498 71		363 55		17 66			6 50			111 00
tuart.....	998 08		670 00		31 28			38 74			247 05
Susie M.....	458 57		310 10		44 77			6 70		1 20	97 00
Sylvia.....	647 05		400 00		108 80			13 25			125 00
T. M. G.....	933 39		654 84		67 80			6 80			203 95
V. V.....	144 00		100 00								44 00
Willean.....	975 54		536 67		259 33			22 58		1 96	155 00
Wonder No. 3.....	811 62	44,722 88	500 00		124 10			34 02			153 50
	225,170 77		111,464 73	2,942 43	20,912 25	1,655 40	6,989 87	5,978 28	1,120 03	2,171 06	71,632 46
General Account.....	6 15						3 15				3 00

SUMMARY

Nova Scotia.....	12,806 21		7,824 88	1 50	1,053 61	338 49	1,231 66	468 92	214 05	210 11	60 35	1,402 64
Prince Edward Island.....	16,212 29		6,193 59	220 70	1,048 45	3,265 33	2,198 71	409 10	184 31	43 74	53 10	2,595 26
New Brunswick.....	17,210 17		10,231 00		1,716 40	17 52	1,003 45	900 77	124 10	124 95	41 55	3,050 43
Manitoba.....	22,680 03		10,158 08	2,921 93	6,237 31	774 48	77 70	1,091 29	1,091 29	125 89	691 00	186 48
British Columbia.....	225,170 77		111,464 73	2,942 43	20,912 25	1,655 40	6,989 87	5,978 28	1,120 03	2,171 06	304 26	71,632 46
General Account.....	6 15						3 15					3 00
	294,085 62		145,872 28	6,086 56	30,968 02	6,051 22	11,504 54	8,172 94	2,733 78	2,675 75	1,150 26	78,870 27

DETAILED STATEMENT OF FISHERIES PROTECTION SERVICE

<i>General Account</i>	244 80	.....	.....	.....	.....	.....	.....	.....	.....	55 62	189 18
<i>East Coast—</i>											
Arleux.....	41,722 91	24,579 56	5,232 44	5,167 68	1,967 17	1,801 38	478 75	835 75	359 39	814 96	395 83
Arras.....	49,698 98	24,944 73	5,227 12	8,992 05	3,232 40	2,980 00	682 78	927 58	693 39	538 64	1,480 29
	91,421 89	49,524 29	10,459 56	14,159 73	5,199 57	4,871 38	1,161 53	1,763 33	1,052 78	1,353 60	1,876 12
<i>West Coast—</i>											
Givenchy.....	50,377 67	25,108 57	6,208 00	8,129 22	3,546 25	2,158 69	1,031 38	1,332 10	1,329 12	940 77	593 57
Malaspina.....	53,939 65	29,740 64	6,229 43	11,144 92	530 85	1,473 07	714 35	422 67	1,106 69	1,789 26	787 77
	104,317 32	54,849 21	12,437 43	19,274 14	4,077 10	3,631 76	1,745 73	1,754 77	2,435 81	2,730 03	1,381 34

SUMMARY

<i>General Account</i>	244 80	.....	.....	.....	.....	.....	.....	.....	.....	55 62	189 18
East Coast.....	91,421 89	49,524 29	10,459 56	14,159 73	5,199 57	4,871 38	1,161 53	1,763 33	1,052 78	1,353 60	1,876 12
West Coast.....	104,317 32	54,849 21	12,437 43	19,274 14	4,077 10	3,631 76	1,745 73	1,754 77	2,435 81	2,730 03	1,381 34
	195,994 01	104,373 50	22,896 99	33,433 87	9,276 67	8,503 14	2,907 26	3,518 10	3,488 59	4,139 25	3,446 64

EXPENDITURE, 1928-29

DETAILED STATEMENT OF FISH CULTURE

Hatcheries	Salaries		Maintenance		Total of hatchery		Total of provinces	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
<i>Nova Scotia</i>							111,139	02
Antigonish.....	360	00	35,233	08	35,593	08		
Bedford.....	2,685	00	8,107	60	10,792	60		
Lindloff.....			944	22	944	22		
Margaree.....	4,200	00	4,730	20	8,930	20		
Margaree Pond.....	270	97	1,864	08	2,135	05		
Middleton.....	2,376	67	4,932	97	7,309	64		
Windsor.....	1,500	00	2,113	46	3,613	46		
Yarmouth.....	240	00	41,580	77	41,820	77		
<i>Prince Edward Island</i> —.....							4,799	60
Kelly's Pond Hatchery.....	3,060	00	1,739	60	4,799	60		
<i>New Brunswick</i>							62,034	34
Florenceville.....	1,150	00	11,414	00	12,564	00		
Grand Falls.....	2,526	13	2,618	37	5,144	50		
Miramichi.....	2,820	00	3,178	38	5,998	38		
Miramichi Pond.....			2,145	87	2,145	87		
Nepisiquit.....			847	02	847	02		
New Mills Pond.....	720	00	3,041	92	3,761	92		
Restigouche.....	2,760	00	3,696	47	6,456	47		
Sparkle.....	4	00	22	00	26	00		
St. John Hatchery.....	2,270	00	9,910	81	12,180	81		
St. John Pond.....	1,500	00	12,668	55	12,668	55		
Tobique.....			240	82	240	82		
<i>Manitoba</i>							30,335	78
Dauphin River Spawn Camp.....			1,677	88	1,677	88		
Dauphin River.....			294	95	294	95		
Gull Harbour.....	2,019	35	4,030	27	6,049	62		
Swan Creek Hatchery.....			7,777	38	7,777	38		
Winnipegosis.....	2,691	67	11,844	28	14,535	95		
<i>Saskatchewan</i>							8,753	11
Qu'Appelle.....	3,000	00	5,753	11	8,753	11		
<i>Alberta</i>							68,736	67
Banff.....	3,240	00	5,018	90	8,258	90		
Cold Lake.....			1,125	09	1,125	09		
Jasper Park.....			500	65	500	65		
Lesser Slave Lake.....	1,164	84	49,120	49	50,285	33		
Spray Lakes.....			1,002	53	1,002	53		
Waterton Park.....	600	00	6,964	17	7,564	17		
<i>British Columbia</i>							123,217	69
General.....	8,225	78	2,815	71	11,041	49		
Anderson.....	2,338	87	6,802	73	9,141	60		
Babine.....	3,140	22	7,419	94	10,560	16		
Cowichan.....	3,531	27	3,435	14	6,966	41		
Cranbrook Eyeing station.....	457	90	783	40	1,241	30		
Cultus.....	2,201	46	5,169	17	7,370	63		
Gerrard.....	59	35	1,872	86	1,932	21		
Harrison.....	500	74	4,543	15	5,043	89		
Kennedy.....	2,918	79	4,511	31	7,430	10		
Lloyds Creek Eyeing Station.....	482	98	1,727	43	2,210	41		
Nelson Eyeing Station.....	2,218	75	3,909	19	6,127	94		
Pemberton.....	4,984	06	6,905	57	11,889	63		
Penask Lake Eyeing Station.....	700	00	997	78	1,697	78		
Pitt.....	1,530	16	4,955	88	6,486	04		
Rivers Inlet.....	3,615	20	7,315	34	10,930	54		
Skeena.....	4,469	22	10,601	00	15,070	22		
Stuart.....	2,171	13	5,006	21	7,177	34		
Summerland.....	187	55	712	45	900	00		
<i>General Account</i>	6,360	00	19,095	37	25,455	37	25,455	37
	89,752	06	344,719	52			434,471	58

DETAILED STATEMENT OF FISH CULTURE—*Concluded*
SUMMARY

Hatcheries	Salaries		Maintenance		Total of hatchery	Total of provinces
	\$	cts.	\$	cts.	\$	cts.
Nova Scotia.....	11,632	64	99,506	38	111,139	02
Prince Edward Island.....	3,060	00	1,739	60	4,799	60
New Brunswick.....	12,250	13	49,784	21	62,034	34
Manitoba.....	4,711	02	25,624	76	30,335	78
Saskatchewan.....	3,000	00	5,753	11	8,753	11
Alberta.....	5,004	84	63,731	83	68,736	67
British Columbia.....	43,733	43	79,484	26	123,217	69
General Account.....	6,360	00	19,095	37	25,455	37
	89 752	06	344,719	52	.....	434,471 58

DETAILED STATEMENT OF CONSERVATION AND DEVELOPMENT OF DEEP SEA
FISHERIES, 1923-29

General Account.....	\$	7,396	98
Demonstration building.....		2,446	51
Destruction hair seals.....		709	92
Destruction of predatory fish.....		12	00
Marine laboratory.....		17,300	69
Shell fish.....		22	64
Scallop investigation.....		6,276	99
Technical education.....		2,040	69
Transportation of fish (collecting boats)			
General Account.....		932	79
Bickerton-Canso service.....		16,081	40
Sonora-Halifax service.....		19,624	36
Cape Breton service.....		19,793	79
Lockport-Port Latour service.....		3,135	48
		59,567	82
Royal Commission.....		17,808	49
		<u>\$ 113,582</u>	<u>73</u>

MARINE AND FISHERIES

SUMMARY BY PROVINCES FISHERIES EXPENDITURE, 1928-29

[illegible]

DETAILED STATEMENT OF MARINE BIOLOGICAL BOARD EXPENDITURE, 1928-29

"A"—General Account.....		298 52	
<i>St. Andrews Biological Station</i>	33,488 25		
<i>"Prince"</i>	2,928 01		
		\$	36,416 26
<i>Nanaimo Biological Station</i>	35,770 62		
<i>"A.P. Knight"</i>	3,010 65		
Chum and Pink Salmon Investigation.....	3,417 86		
Chum and Pink Salmon Tagging.....	1,003 38		
Clam Investigation.....	414 68		
Herring and Pilchard.....	2,552 66		
Oyster Investigation.....	738 18		
Shrimp Investigation.....	366 11		
			47,274 14
<i>Advances Outstanding</i>			10
		\$	83,989 02
"B"—General Account.....		\$	4,464 74
<i>Atlantic Experimental Station</i>	25,854 54		
Cod Investigation.....	949 81		
Fish Curing Investigation.....	3,713 92		
Fishermans Course.....	3,201 66		
Haddock Investigation.....	685 89		
Mackerel Investigation.....	505 15		
			34,910 97
<i>Pacific Experimental Station</i>	\$ 24,358 34		
Investigations General.....	647 85		
Discoloration Investigation.....	178 29		
Field Investigation.....	4,378 06		
Glue Investigation.....	89 92		
Meals Investigation.....	331 90		
Oils Investigation.....	689 29		
Refrigeration Investigation.....	205 59		
Salmon Tagging.....	3,798 98		
		\$	34,678 22
<i>Hudson Strait Expedition</i>			933 82
<i>Advances Outstanding</i>			208 70
		\$	75,196 45
"C"—Atlantic Salmon Investigation.....	1,080 31		
Fry Planting.....			
Brook Trout Investigation.....	1,277 95		
Cultus Lake Investigation.....	10,970 98		
Eagle River Investigation.....	1,053 36		
Experimental Demonstration in Hatching and Rearing.....	527 00		
General Lakes Survey.....	2,261 17		
Lobster Investigation.....	461 84		
Maritime Lakes Investigation.....	8 80		
Oyster Investigation.....	277 16		
Pacific Trout Investigation.....			
Field Investigation.....	2,467 38		
Prairie Lakes Investigation.....	8,518 75		
Lake Athabaska.....	654 04		
Rearing Ponds—Taft.....	3 40		
Shadfish Investigation.....	447 43		
Whitefish Investigation.....	469 35		
			30,478 92
<i>Advances Outstanding</i>			92 15
			30,571 07
		\$	189,756 54

APPENDIX No. 8

STATEMENT OF EXPENDITURE AND REVENUE, BY PROVINCES, IN
FISHERIES SERVICES 1867-1928 UNDER DOMINION
GOVERNMENT

SUMMARY

	Expenditure		Revenue	
	\$	cts.	\$	cts.
Nova Scotia.....	4,539,773	56	325,405	09
Prince Edward Island.....	721,471	71	99,013	97
New Brunswick.....	3,425,778	83	552,772	12
Quebec.....	2,425,733	12	341,261	99
Ontario.....	3,214,671	13	520,135	96
Manitoba and North-West Territories.....	23,414	29	4,779	25
Manitoba.....	1,647,963	15	293,431	81
North-West Territories.....	58,258	58	9,775	23
Alberta.....	409,563	06	177,343	85
Saskatchewan.....	514,589	40	90,729	60
British Columbia.....	10,692,574	77	2,618,817	69
Yukon.....	29,343	94	10,707	75
Hudson Bay District.....			821	83
	27,703,135 54			
CRUISERS				
Nova Scotia, Prince Edward Island and New Brunswick.....	4,879,239	21		
	32,582,374	75		
Expenditures, general.....	3,219,922	64		
	35,802,297	39		
Fishing bounty, 1882-1928.....	7,430,315	41		
Total expenditure, 1867-1928.....	43,232,612	80		

FISHING BOUNTIES

Year	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Totals
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1882.....	106,098 72	16,997 00	16,137 00	33,052 75	172,285 47
1883.....	89,432 50	12,395 20	8,577 14	19,940 01	130,344 85
1884.....	104,934 09	13,576 00	9,230 96	28,004 93	155,718 98
1885.....	103,999 73	15,908 25	10,166 65	31,464 76	161,539 39
1886.....	98,789 54	17,894 57	10,935 87	33,283 61	160,903 59
1887.....	99,662 03	19,699 65	12,528 51	31,907 73	163,757 92
1888.....	89,778 90	18,454 92	9,092 96	32,858 75	150,185 53
1889.....	90,142 51	21,026 79	13,994 53	33,362 71	158,526 54
1890.....	91,235 64	21,108 33	11,686 32	34,210 72	158,241 01
1891.....	92,377 42	17,235 96	12,771 30	34,507 17	156,891 85
1892.....	109,410 39	10,864 61	9,782 79	29,694 35	159,752 14
1893.....	108,060 67	12,524 09	9,328 62	28,320 72	158,234 10
1894.....	111,460 03	12,690 80	7,875 79	28,040 18	160,066 80
1895.....	110,765 27	12,919 32	9,285 13	30,598 27	163,567 99
1896.....	98,048 95	13,602 88	9,745 50	32,992 44	154,389 77
1897.....	102,083 50	13,454 50	9,809 00	32,157 00	157,504 00
1898.....	103,730 00	13,746 00	10,188 00	31,795 00	159,459 00
1899.....	106,598 50	13,514 50	7,822 00	32,065 00	160,000 00
1900.....	101,448 00	13,562 50	10,589 00	33,203 00	158,802 50
1901.....	101,024 50	13,420 50	8,335 50	33,161 50	155,942 00
1902.....	100,455 70	14,555 80	8,716 55	36,125 45	159,853 50
1903.....	99,714 15	14,872 75	9,652 50	34,703 30	158,943 70
1904.....	99,286 44	15,110 80	9,179 35	33,651 65	157,228 24
1905.....	100,664 35	15,379 50	8,317 20	34,185 60	158,546 65

FISHING BOUNTIES—*Concluded*

Year	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1906.....	99,518 80	16,247 55	8,839 40	34,410 00	159,015 75
1907.....	93,381 70	16,454 50	10,175 95	36,101 35	156,113 50
1908.....	98,156 20	17,203 75	9,708 90	34,931 05	159,999 90
1909.....	95,413 60	15,480 15	8,973 85	35,354 25	155,221 85
1910.....	96,468 20	16,531 05	9,557 80	36,609 70	159,166 75
1911.....	99,424 90	15,795 00	8,669 85	36,109 95	159,999 70
1912.....	97,904 25	15,109 75	11,119 00	35,863 40	159,996 40
1913.....	93,456 00	16,385 05	11,081 85	37,738 35	158,661 25
1914.....	94,990 54	17,536 50	10,339 65	36,717 45	159,584 14
1915.....	90,611 05	17,609 95	9,513 95	41,006 10	158,741 05
1916.....	88,212 10	17,540 15	9,961 95	44,285 60	159,999 80
1917-18.....	86,115 60	17,538 35	10,754 75	45,484 40	159,893 10
1918-19.....	85,000 65	17,114 35	10,392 35	47,167 90	159,675 25
1919-20.....	85,521 05	16,085 20	8,702 20	44,828 25	155,136 70
1920-21.....	93,873 00	13,773 70	8,110 70	36,761 90	152,519 30
1921-22.....	91,410 20	14,640 60	9,413 00	43,986 00	159,449 80
1922-23.....	93,254 45	16,311 25	7,704 40	39,902 45	157,172 55
1923-24.....	91,261 55	16,123 25	10,153 65	42,378 35	159,916 80
1924-25.....	86,300 20	15,634 05	11,410 15	46,482 00	159,826 40
1925-26.....	82,550 35	18,824 30	10,670 70	47,939 45	159,984 80
1926-27.....	83,006 90	16,721 00	13,221 55	46,818 65	159,768 10
1927-28.....	82,107 00	19,906 80	12,095 45	44,266 55	158,375 80
1928-29.....	79,077 60	19,387 80	9,334 30	43,611 50	151,411 20
	4,506,177 42	748,469 27	473,626 52	1,702,042 20	7,430,315 41

STATEMENT SHOWING THE ANNUAL EXPENDITURE ON ACCOUNT OF MARINE POLICE SERVICE ON THE ATLANTIC COASTS OF CANADA FOR PATROLLING THE TERRITORIAL FISHERIES 1870-1874 INCLUSIVE

1870.....	\$	
1871.....		73,550 86
1872.....		50,123 24
1873.....		53,794 90
1874.....		15,364 69
		192,833 69

During the period 1875 to 1885, inclusive, the Washington Treaty, which gave United States fishermen the use of Canadian Inshore fisheries, was in force.

On the expiry of the Fishery Articles of the Treaty of Washington, the present Fisheries Protection Service was organized in 1886. The following is a statement of the annual expenditure on such account from 1886 to 1928-29 inclusive.

FISHERIES PROTECTION SERVICE

In addition to Cruisers, entered under Ontario, Quebec and British Columbia:—

1886.....	\$	104,020 98	1897.....	\$	71,349 44
1887.....		86,300 74	1898.....		78,097 10
1888.....		59,869 47	1899.....		68,330 27
1889.....		47,748 94	1900.....		66,148 97
1890.....		51,296 34	1901.....		96,648 26
1891.....		81,918 99	1902.....		75,942 24
1892.....		84,305 51	1903.....		75,543 60
1893.....		60,269 69	1904.....		103,427 32
1894.....		70,501 71	1905.....		294,440 34
1895.....		61,310 19	1906.....		136,432 61
1896.....		64,064 00	1907.....		99,015 07

(No proper division of the expenditure of these roving Cruisers could be made between the Maritime Provinces, although *pro rata* shares are fairly chargeable to N.S., N.B., and P.E.I.)

1908-09.....	\$	114,923 00	1918-19.....		56,256 78
1909-10.....		113,582 23	1919-20.....		218,143 93
1910-11.....		116,235 21	1920-21.....		227,159 57
1911-12.....		120,240 00	1921-22.....		172,003 39
1912-13.....		163,370 19	1922-23.....		107,658 85
1913-14.....		225,113 26	1923-24.....		95,332 27
1914-15.....		95,702 02	1924-25.....		95,714 47
1915-16.....		102,637 16	1925-26.....		98,060 10
1916-17.....		132,393 60	1926-27.....		113,804 14
1917-18.....		118,824 16	1927-28.....		125,015 62
			1928-29.....		125,920 64

\$ 4,867 906 36

A pro-rate share of this amount is chargeable to the Provinces of N.S., N.B., and P.E.I.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION.

PROVINCE OF NOVA SCOTIA

Year	General Service		Cruisers		Fish Breeding		Total		Revenue	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1867.....										
1868.....		225 28					225 28		12,275	25
1869.....		2,572 23					2,572 23		848	46
1870.....		9,728 26					9,728 26	*	1,373	24
1871.....		8,794 37					8,794 37		36	74
1872.....		8,341 39					8,341 39		51	45
1873.....		8,689 07					8,689 07		159	30
1874.....		10,585 13					10,585 13		123	94
1875.....		12,265 86					12,265 86		551	00
1876.....		14,655 76			6,870 33		21,526 09		403	00
1877.....		15,127 49			3,488 27		18,615 76		1,520	71
1878.....		15,292 83			3,400 00		18,692 83		1,442	38
1879.....		14,312 76			2,687 44		17,000 20		1,796	11
1880.....		14,180 55			3,323 16		17,503 71		1,506	72
1881.....		14,909 42			3,454 29		18,363 71		2,779	49
1882.....		16,479 41			5,858 98		22,338 39		1,111	61
1883.....		16,247 14			4,191 34		20,438 48		2,005	29
1884.....		15,600 01			4,728 11		20,428 12		1,833	18
1885.....		17,503 45			4,610 81		22,114 26		2,616	28
1886.....		17,852 33			7,478 23		25,330 56		2,166	53
1887.....		18,092 21			6,701 89		24,794 00		1,585	28
1888.....		18,308 02			6,850 27		25,158 29		3,905	44
1889.....		20,201 09			6,688 75		26,889 84		2,744	23
1890.....		17,395 24			6,606 95		24,002 19		5,424	95
1891.....		17,844 19			5,863 75		23,707 94		5,891	65
1892.....		18,755 86			10,289 80		29,045 66		3,803	42
1893.....		19,444 22			5,045 22		24,489 44		6,782	02
1894.....		20,420 81			4,982 12		25,402 93		5,296	27
1895.....		23,555 38			5,054 24		28,609 62		7,075	07
1896.....		23,049 41			5,010 39		28,059 80		6,180	93
1897.....		23,682 33			4,077 07		27,759 40		5,239	55
1898.....		21,683 91			3,525 03		25,208 94		5,317	08
1899.....		25,348 11			2,465 19		27,813 30		4,668	22
1900.....		27,461 91			3,410 84		30,872 75		5,494	49
1901.....		35,730 69			11,194 82		46,925 51		6,595	94
1902.....		32,618 00			8,810 31		41,428 31		6,084	65
1903.....		39,118 79			7,413 55		46,532 34		3,962	45
1904.....		30,003 01			6,348 22		36,351 23		3,716	75
1905.....		32,619 85			11,372 65		43,992 50		6,718	58
1906.....		49,351 10			33,203 27		82,554 37		4,934	43
1907.....		24,989 09			6,259 25		31,248 34		3,118	73
1908-09.....		87,420 00			20,969 27		108,389 27		5,369	70
1909-10.....		81,698 70			15,722 27		97,420 97		3,821	81
1910-11.....		117,394 67			28,023 29		145,417 96		7,749	60
1911-12.....		141,148 00			42,727 00		183,875 00		5,912	65
1912-13.....		97,085 47			46,411 56		143,497 04		6,730	00
1913-14.....		125,305 94			45,732 88		171,038 82		7,682	50
1914-15.....		124,977 45			37,470 70		162,448 15		7,415	80
1915-16.....		117,271 06			34,914 01		152,185 07		6,969	18
1916-17.....		126,416 67			33,543 89		159,960 56		7,176	70
1917-18.....		139,964 62			36,057 56		176,022 18		6,663	94
1918-19.....		112,689 57			17,233 22		129,922 79		7,612	81
1919-20.....		92,197 95			16,243 01		109,160 96		10,213	28
1920-21.....		111,196 47			22,077 83		133,274 30		12,189	62
1921-22.....		112,521 25			21,247 10		133,768 35		10,840	39
1922-23.....		121,336 89			27,399 27		148,736 16		12,720	42
1923-24.....		138,671 11			42,395 03		181,066 14		9,480	38
1924-25.....		153,463 48			32,467 75		185,931 23		10,627	54
1925-26.....		170,967 83			31,053 08		202,020 91		9,539	68
1926-27.....		171,975 48			29,869 84		201,845 32		10,973	25
1927-28.....		237,097 63			28,148 93		265,246 56		11,758	25
1928-29.....		253,106 30			111,139 02		364,245 32		12,816	88
		3,607,662 51			932,111 05		4,539,773 56		325,405	09

See Cruiser Sheet N.S., P.E.I., and N.B.

(*Revenue from licenses to U.S. Fishing Vessels to which the Province has no exclusive title.)

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION

PROVINCE OF PRINCE EDWARD ISLAND

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$		\$	\$	\$
1867					
1868					
1869					
1870					
1871					
1872					
1873					
1874	405 62			405 62	
1875	459 54			459 54	
1876	461 02			461 02	
1877	1,974 70			1,974 70	
1878	1,836 54			1,836 54	
1879	1,293 25			1,293 25	
1880	2,686 49				
1881	2,691 49		4,494 24	7,180 83	40 00
1882	2,756 48		852 11	3,543 60	40 00
1883	2,716 64		760 32	3,516 80	40 00
1884	2,767 98		807 32	3,523 96	80 00
1885	3,028 03		771 40	3,539 38	80 00
1886	3,187 73		741 06	3,769 09	40 00
1887	4,044 49		687 17	3,874 90	40 00
1888	3,402 51		1,200 21	5,244 70	128 00
1889	3,746 69		755 32	4,157 83	
1890	3,113 21		140 31	3,887 00	140 00
1891	3,242 25			3,113 21	302 88
1892	1,835 65		378 00	3,620 25	667 00
1893	2,847 60			1,835 65	166 00
1894	3,078 55			2,847 60	304 10
1895	3,796 58			3,078 55	980 15
1896	3,555 87			3,796 58	3,312 30
1897	3,744 36			3,555 87	2,161 85
1898	6,775 78			3,744 36	2,032 25
1899	5,832 35			6,775 78	2,707 57
1900	7,364 20			5,832 35	2,242 24
1901	7,934 03			7,364 20	2,207 12
1902	7,814 02			7,934 03	1,525 30
1903	7,081 60			7,814 02	1,843 45
1904	7,320 96			7,081 60	2,007 35
1905	6,879 05		10,733 51	18,054 47	1,983 42
1906	9,351 81		6,813 77	13,692 82	2,046 50
1907	5,841 67		6,419 04	15,770 85	2,206 25
1908-09	14,996 00		2,952 47	8,794 14	1,300 94
1909-10	13,657 56		7,187 47	22,183 47	2,393 66
1910-11	38,570 72		8,139 50	21,797 06	2,359 93
1911-12	13,661 00		8,874 42	47,445 14	2,499 63
1912-13	13,558 06		8,876 00	22,537 00	2,477 50
1913-14	13,728 89		6,105 63	19,663 69	2,927 96
1914-15	17,369 93		7,383 45	21,112 34	2,245 60
1915-16	14,794 05		8,071 93	25,441 86	2,046 50
1916-17	15,843 23		9,658 61	24,432 66	3,165 35
1917-18	19,076 19		7,211 18	23,054 41	3,597 18
1918-19	15,722 08		7,994 24	27,070 43	3,256 26
1919-20	17,430 98		3,003 84	18,725 92	2,561 19
1920-21	22,911 72		2,918 40	20,349 38	4,741 68
1921-22	15,430 17		4,312 69	27,224 41	3,720 12
1922-23	17,996 16		4,304 58	19,734 75	2,876 47
1923-24	22,111 52		4,801 56	22,797 72	5,854 88
1924-25	26,051 31		4,859 03	26,970 55	4,441 95
1925-26	26,719 74		5,147 60	31,198 91	3,134 90
1926-27	20,302 73		6,609 94	33,329 68	3,467 88
1927-28	19,176 79		4,533 27	24,836 00	3,403 13
1928-29	39,129 65		5,085 20	24,261 99	3,766 28
			4,799 60	43,929 25	3,451 25
	553,107 22		168,364 49	721,471 71	99,013 97

See Cruiser Sheet N.S., P.E.I., and N.B.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION

PROVINCE OF NEW BRUNSWICK

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867.....					
1868.....	5,086 77			5,086 77	443 47
1869.....	4,172 35			4,172 35	*5,410 58
1870.....	8,422 63			8,422 63	1,086 42
1871.....	7,006 52			7,006 52	1,042 03
1872.....	6,476 61			6,476 61	1,053 29
1873.....	6,859 05		822 33	7,681 38	647 61
1874.....	7,351 17		3,100 13	10,451 30	978 00
1875.....	7,373 75		3,853 73	11,227 48	830 00
1876.....	10,080 37		3,247 41	13,327 78	2,030 91
1877.....	11,168 53		1,388 80	12,557 33	1,289 17
1878.....	10,926 11		1,468 22	12,394 33	2,015 46
1879.....	10,858 64		1,139 00	11,997 64	3,467 36
1880.....	12,291 00		5,600 00	17,891 00	4,276 07
1881.....	11,776 56		3,455 91	15,232 47	4,695 28
1882.....	12,284 82		3,567 28	15,852 10	4,848 84
1883.....	13,007 00		2,646 14	15,653 14	4,612 12
1884.....	14,388 02		2,327 06	16,715 08	3,905 66
1885.....	14,892 87		2,943 98	17,836 85	4,650 16
1886.....	15,719 36		2,852 02	18,571 38	4,078 10
1887.....	16,944 00		2,907 16	19,851 16	4,417 52
1888.....	20,533 20		3,441 59	23,974 79	7,625 64
1889.....	20,298 00		3,150 17	23,448 17	8,642 88
1890.....	14,914 95		3,727 77	18,642 72	8,834 35
1891.....	16,082 77		4,572 41	20,655 18	7,233 69
1892.....	15,707 98		4,304 98	20,012 96	6,634 83
1893.....	15,721 05		4,988 13	20,709 18	7,831 53
1894.....	18,522 94		4,833 27	23,356 21	8,333 24
1895.....	21,370 94		5,896 95	27,267 89	11,170 36
1896.....	20,526 56		6,551 62	27,078 18	10,696 88
1897.....	21,671 92		3,722 01	25,393 93	10,110 77
1898.....	17,063 58		3,958 63	21,022 21	11,511 85
1899.....	22,922 50		7,514 86	30,437 36	10,430 08
1900.....	21,459 94		3,951 58	25,411 52	12,015 27
1901.....	28,452 51		5,976 29	34,428 80	10,150 40
1902.....	23,813 62		12,245 86	36,059 48	11,658 34
1903.....	27,132 84		16,099 01	43,231 85	11,188 02
1904.....	27,664 34		22,177 05	49,841 39	10,643 20
1905.....	25,253 16		15,477 39	40,730 55	11,898 99
1906.....	35,856 38		25,759 09	61,615 47	11,395 84
1907.....	24,938 35		16,900 00	41,838 35	9,158 08
1908-09.....	71,091 00		22,214 39	93,305 39	12,385 14
1909-10.....	63,154 19		21,102 75	84,256 94	13,044 88
1910-11.....	63,769 48		20,414 56	84,184 04	12,996 84
1911-12.....	58,140 00		22,950 00	81,090 00	13,902 15
1912-13.....	60,943 53		30,267 38	91,210 91	15,192 52
1913-14.....	63,653 64		51,641 12	115,294 76	17,507 18
1914-15.....	67,954 09		52,560 08	120,514 17	14,263 99
1915-16.....	65,874 11		40,876 42	106,750 53	15,097 80
1916-17.....	67,645 91		37,987 56	105,633 47	15,137 19
1917-18.....	70,148 87		37,021 69	107,170 56	14,429 53
1918-19.....	67,763 94		36,351 19	104,115 13	16,420 52
1919-20.....	73,821 07		34,275 01	108,096 08	16,441 02
1920-21.....	86,431 23		41,493 38	127,924 61	15,299 82
1921-22.....	102,713 10		44,971 62	147,684 72	16,212 85
1922-23.....	96,836 88		50,298 75	147,135 63	19,286 01
1923-24.....	71,052 58		40,870 11	111,922 69	13,010 14
1924-25.....	97,200 01		46,096 12	143,296 13	11,701 49
1925-26.....	106,052 99		50,910 64	156,963 63	9,754 13
1926-27.....	99,696 49		48,245 23	147,941 72	10,740 76
1927-28.....	113,738 34		102,131 24	215,869 58	12,663 50
1928-29.....	99,822 31		62,034 34	161,856 65	14,337 67
	2,314,497 42		1,111,281 41	3,425,778 83	552,772 12

See Cruiser Sheet N.S., P.E.I., and N.B.

FISHERIES BRANCH

239

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION.

PROVINCE OF QUEBEC

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867.....	10,272 82	14,426 53		24,699 35	6,998 90
1868.....	17,889 92	11,374 95		29,264 87	4,910 87
1869.....	6,909 61	10,800 00		17,709 61	4,585 80
1870.....	6,570 42	9,924 51		16,494 93	*7,997 21
1871.....	7,000 00	9,000 00		16,000 00	6,290 85
1872.....	6,489 68	12,000 00		18,489 68	4,569 69
1873.....	7,829 94	9,000 00		16,829 94	4,983 83
1874.....	9,265 31	10,000 00	6,106 00	25,371 31	8,523 54
1875.....	9,808 34	10,000 00	8,515 46	28,323 80	8,904 85
1876.....	14,282 65	23,832 82	9,016 74	47,132 21	6,437 00
1877.....	13,521 44	17,059 21	5,670 86	36,251 51	5,881 72
1878.....	12,723 88	19,967 11	6,685 85	39,376 8	5,453 27
1879.....	13,606 06	8,994 48	5,772 90	28,373 44	6,286 07
1880.....	12,591 78	1,880 08	4,701 34	19,173 20	7,124 42
1881.....	15,123 79	50,550 18	5,444 89	71,118 86	9,286 18
1882.....	14,819 22	26,965 40	9,148 68	50,933 30	7,165 32
1883.....	13,287 30	26,555 46	7,987 12	47,829 88	3,869 47
1884.....	13,186 26	19,935 53	8,512 11	41,633 90	2,715 02
1885.....	13,531 77	*31,514 07	10,072 52	55,118 36	3,325 35
1886.....	13,938 21	26,091 20	9,197 89	49,227 30	2,963 75
1887.....	14,966 55	18,293 16	8,740 66	42,000 37	3,804 66
1888.....	13,463 37	17,233 51	8,921 13	39,618 01	5,394 99
1889.....	12,991 63	16,034 04	10,228 72	39,254 39	3,390 79
1890.....	9,670 94	15,001 91	8,370 15	33,043 00	5,409 81
1891.....	10,666 98	15,143 46	9,142 31	34,952 75	3,642 14
1892.....	10,917 36	14,026 98	8,341 94	33,286 28	5,244 82
1893.....	11,761 34	14,688 97	9,337 79	35,788 10	7,471 70
1894.....	11,692 82	25,645 29	8,635 41	45,973 52	7,211 82
1895.....	12,459 34	19,523 86	8,854 64	40,837 84	8,836 18
1896.....	11,870 43	20,661 78	8,260 50	40,792 71	8,160 98
1897.....	12,910 80	12,059 54	7,059 45	32,029 79	7,876 12
1898.....	11,140 16	13,781 53	6,128 40	31,050 09	7,571 15
1899.....	11,350 27	21,680 55	5,700 58	38,731 40	6,287 71
1900.....	5,452 41	18,970 42	12,701 04	37,123 87	2,543 04
1901.....	7,934 03	16,258 44	15,218 64	39,411 11	4,738 92
1902.....	6,242 58	24,995 46	20,142 94	51,380 98	2,498 85
1903.....	6,585 86	21,021 00	8,080 03	35,686 89	4,379 15
1904.....	7,619 67	23,011 05	11,454 24	42,084 96	5,070 64
1905.....	6,769 16	15,976 88	14,140 65	36,886 69	4,648 56
1906.....	8,123 04	26,969 49	12,617 01	47,709 54	7,564 39
1907.....	5,590 94	22,763 29	10,683 24	39,037 47	8,145 97
1908-09.....	11,960 00	36,402 00	16,760 46	65,122 46	6,797 91
1909-10.....	10,316 05	25,811 96	19,292 31	55,420 32	4,947 46
1910-11.....	8,984 36	42,975 48	20,290 50	72,250 34	5,336 61
1911-12.....	17,050 00	32,998 00	18,104 00	68,152 00	6,044 75
1912-13.....	10,998 48	25,321 81	17,152 03	53,472 32	8,095 79
1913-14.....	9,921 88	29,770 88	23,042 82	62,735 58	5,286 89
1914-15.....	11,503 00	30,644 81	22,000 08	64,147 89	7,638 75
1915-16.....	6,995 74	31,893 30	17,323 62	56,212 66	6,006 89
1916-17.....	7,168 09	26,356 47	14,274 14	47,798 70	6,981 14
1917-18.....	8,399 76	42,752 33	19,727 25	70,879 34	7,664 73
1918-19.....	7,470 58	41,563 30	12,923 27	61,957 15	8,121 80
1919-20.....	9,793 46	33,679 99	13,125 26	56,598 71	8,085 78
1920-21.....	33,182 26	45,963 09	15,955 38	95,100 73	6,536 90
1921-22.....	23,815 41	49,947 22	18,772 19	92,134 82	14,357 39
1922-23.....	2,146 60	904 32	2,668 48	5,719 40	
1923-24.....	282 90	143 81		426 71	
1924-25.....	178 47			178 47	
1925-26.....	596 52			596 57	
1926-27.....	123 12			123 12	
1927-28.....	144 84			144 84	
1928-29.....	128 94			128 94	192 70
	623,978 59	1,240,740 91	561,003 62	2,425,733 12	341,261 99

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION.

PROVINCE OF ONTARIO

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867.	6,108 00			6,108 00	3,492 00
1868.	6,526 96			6,526 96	1,927 02
1869.	8,547 65			8,547 65	2,739 13
1870.	5,995 72		2,874 47	8,870 19	6,165 56
1871.	5,825 98		4,446 34	10,272 32	5,039 35
1872.	4,364 43		5,529 73	9,894 16	4,818 57
1873.	4,344 32		3,697 16	8,041 48	4,547 50
1874.	8,969 06		5,100 00	14,069 06	4,386 75
1875.	8,388 81		5,635 74	14,024 55	4,478 05
1876.	12,815 73		12,920 90	25,736 63	4,640 21
1877.	13,521 44		12,132 70	25,654 14	4,673 25
1878.	12,723 88		4,949 77	17,673 65	5,202 00
1879.	11,741 40		7,102 54	18,843 94	6,188 80
1880.	12,003 37		5,300 71	17,304 08	6,465 95
1881.	11,506 74		5,422 63	16,929 37	7,795 99
1882.	11,729 77		8,655 82	20,385 59	9,849 18
1883.	13,602 00		7,761 45	21,363 45	9,980 28
1884.	15,192 73		8,011 17	23,203 90	11,345 14
1885.	17,135 98		8,690 15	25,826 13	11,914 37
1886.	17,900 74		9,696 54	27,597 28	15,917 62
1887.	19,534 01		8,880 14	28,414 15	15,063 57
1888.	19,860 52		9,529 00	29,389 52	18,251 25
1889.	19,264 98	2,631 46	11,811 33	33,207 77	24,266 06
1890.	14,539 87	2,254 63	11,494 31	28,288 81	23,666 95
1891.	15,540 30	2,769 29	11,769 81	30,079 40	26,611 70
1892.	15,155 83	5,064 91	9,281 37	29,502 11	26,708 00
1893.	20,116 91	32,940 56	11,194 65	64,252 12	30,623 09
1894.	22,634 37	20,022 18	10,821 43	53,477 98	28,632 82
1895.	21,938 56	19,373 24	8,755 93	50,067 73	33,211 60
1896.	24,917 48	17,295 94	9,468 37	51,681 79	35,681 68
1897.	21,592 40	15,948 43	8,774 19	46,315 02	32,814 66
1898.	19,239 34	15,155 43	9,976 74	44,371 51	30,574 57
1899.	11,784 22	15,122 45	9,982 10	36,888 97	5,830 85
1900.	3,604 94	12,250 72	10,675 72	26,531 38	794 12
1901.	3,819 57	11,304 51	12,835 60	27,959 68	717 35
1902.	4,445 93	11,764 87	12,445 31	28,656 11	373 42
1903.	4,660 53	12,334 37	14,844 36	31,839 26	1,81 83
1904.	4,500 43	45,133 10	15,300 46	64,933 99	2,578 48
1905.	4,294 60	109,560 51	13,832 32	127,687 43	1,471 91
1906.	4,949 67	32,585 51	15,069 17	52,604 35	499 15
1907.	3,188 34	32,698 85	14,112 42	49,999 61	349 10
1908-09.	14,898 00	36,038 00	28,358 02	79,294 02	790 78
1909-10.	9,672 24	26,009 14	22,614 30	58,295 68	1,520 75
1910-11.	11,788 30	24,237 49	24,393 21	60,419 00	280 25
1911-12.	28,127 00	28,006 00	47,611 00	103,744 00	6 8 45
1912-13.	13,213 90	30,015 23	61,580 26	104,809 41	548 74
1913-14.	22,733 57	27,650 61	68,877 81	119,261 99	806 69
1914-15.	23,048 82	30,169 08	103,182 20	156,400 10	918 80
1915-16.	19,468 64	28,216 58	63,712 73	111,397 95	2,600 65
1916-17.	14,588 69	25,994 06	85,922 62	126,505 37	808 70
1917-18.	15,838 94	36,708 63	69,864 18	122,411 75	2,345 48
1918-19.	4,586 56	53,404 30	64,996 55	122,987 41	631 85
1919-20.	247 00	39,575 17	75,479 78	115,301 95	1,421 80
1920-21.	5 09	84,373 39	82,320 21	166,698 69	9,221 25
1921-22.		52,260 83	80,403 37	132,664 20	44,425 97
1922-23.		27,901 41	79,690 16	107,591 57	4,169 29
1923-24.		355 62	84,180 87	84,536 49	6,076 71
1924-25.			79,471 88	79,471 88	957 73
1925-26.			79,938 10	79,938 10	9,719 28
1926-27.			19,894 97	19,894 97	126 91
1927-28.			25 38	25 38	
1928-29.					
	666,744 26	967,126 52	1,580,800 35	3,214,671 13	520,135 96

FISHERIES BRANCH

241

*MANITOBA AND NORTHWEST TERRITORIES

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867-68.....					
1868-69.....					
1869-70.....					
1870-71.....					
1871-72.....					
1872-73.....					
1873-74.....					
1874-75.....	288 65			288 65	
1875-76.....					
1876-77.....	250 00			250 00	
1877-78.....	200 00			200 00	
1878-79.....	200 00			200 00	
1879-80.....	19 75			19 75	
1880-81.....					
1881-82.....	809 55			809 55	
1882-83.....	150 00			150 00	
1883-84.....	872 40			872 40	
1884-85.....	763 00			763 00	
1885-86.....	1,920 73			1,920 73	
1886-87.....	2,468 25			2,468 25	5 00
1887-88.....	2,816 64			2,816 64	819 25
1888-89.....	2,848 16			2,848 16	848 00
1889-90.....	2,604 70			2,604 70	794 00
1890-91.....	3,609 03			3,609 03	1,234 00
1891-92.....	3,593 43			3,593 43	1,079 00
	23,414 29			23,414 29	4,779 25

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE, SINCE 1892.

*PROVINCE OF MANITOBA

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1892-93.....	2,162 55		6,943 35	9,105 90	1,464 68
1893-94.....	2,187 35		7,362 53	9,549 88	715 85
1894-95.....	2,663 55		3,849 98	6,513 53	2,149 30
1895-96.....	3,952 18		2,865 69	6,817 87	1,670 19
1896-97.....	1,908 14		24 79	1,932 93	1,719 00
1897-98.....	1,206 26		1,586 12	2,792 38	1,515 00
1898-99.....	1,883 37		3,967 36	5,850 73	1,537 85
1899-00.....	1,723 59		2,791 71	4,515 30	2,028 00
1900-01.....	2,669 74		4,174 53	6,844 27	1,103 00
1901-02.....	2,624 87		2,622 43	5,247 30	2,279 00
1902-03.....	3,129 70		2,415 09	5,544 79	1,784 00
1903-04.....	2,789 74		3,978 04	6,767 78	4,002 70
1904-05.....	2,800 64		7,041 67	9,842 31	4,879 70
1905-06.....	3,687 07	7,867 70	25,923 29	37,477 06	4,148 00
1906-07.....	2,173 33	55 00	15,858 35	18,086 68	2,285 98
1907-08.....	4,638 51	13,903 95	25,283 46	43,825 92	3,527 05
1908-09.....	3,946 00	7,560 00	16,987 13	28,493 13	3,704 22
1909-10.....	9,359 23	7,794 02	14,386 86	31,540 11	3,962 88
1910-11.....	9,423 70	7,309 55	15,161 39	31,894 64	8,137 75
1911-12.....	7,371 00	6,571 00	15,793 00	29,735 00	6,334 00
1912-13.....	7,062 15	12,298 62	40,801 11	60,161 88	6,039 00
1913-14.....	29,694 13	48,006 49	47,769 97	125,470 59	4,846 50
1914-15.....	28,887 50	172,677 12	31,532 95	233,097 57	8,312 03
1915-16.....	13,518 89	61,986 35	26,654 36	102,159 60	5,926 00
1916-17.....	13,228 17	19,122 24	25,750 64	58,101 05	8,252 27
1917-18.....	13,164 99	18,943 45	28,277 84	60,386 28	12,910 65
1918-19.....	11,647 78	22,058 23	29,405 83	63,111 84	12,730 20
1919-20.....	8,704 69	21,176 75	26,379 9	56,261 38	12,139 17
1920-21.....	10,979 14	16,787 94	38,893 96	66,661 04	17,792 58
1921-22.....	14,458 95	23,624 52	33,850 69	71,934 16	11,636 54
1922-23.....	17,570 39	21,852 05	30,787 33	70,209 77	12,736 68
1923-24.....	14,630 97	20,051 25	28,429 89	63,112 11	15,633 38
1924-25.....	14,197 83	21,519 12	25,646 64	61,363 59	17,631 21
1925-26.....	17,172 70	22,251 26	21,265 04	60,689 00	17,908 00
1926-27.....	16,769 07	21,775 71	19,924 81	58,379 59	21,291 05
1927-28.....	21,379 96	15,623 11	22,954 22	59,957 29	23,781 18
1928-29.....	21,512 09	22,680 03	30,335 78	74,527 90	24,867 23
	346,789 92	613,495 46	687,677 77	1,647,963 15	293,431 81

*Subsequent to 1892, see Manitoba and Northwest Territories Separate Sheets.

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE
SINCE 1906

PROVINCE OF SASKATCHEWAN

Year	General Services	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1906-07.....	2,677 77			2,677 77	509 00
1907-08.....	7,277 49			7,277 49	948 60
1908-09.....	6,591 00			6,591 00	1,085 50
1909-10.....	6,474 57			6,474 57	1,209 44
1910-11.....	10,470 46			10,470 46	1,246 00
1911-12.....	* 26,040 00			* 26,040 00	1,347 75
1912-13.....	* 17,850 00			* 17,850 00	4,268 50
1913-14.....	* 24,964 74		* 13,969 84	* 38,934 58	8,253 05
1914-15.....	* 34,130 50		20,642 23	54,772 73	4,329 65
1915-16.....	* 31,294 44		4,714 72	36,009 16	3,195 00
1916-17.....	16,002 77		4,897 97	20,900 74	3,103 25
1917-18.....	16,959 11		5,732 96	22,692 07	3,643 65
1918-19.....	16,966 00		5,529 72	22,495 72	4,982 83
1919-20.....	19,019 11		4,147 16	23,166 27	4,321 00
1920-21.....	12,700 20		7,180 29	19,880 49	4,077 30
1921-22.....	15,330 53		6,157 00	21,487 53	3,474 31
1922-23.....	14,212 56		7,887 32	22,099 88	2,904 65
1923-24.....	14,281 88		6,981 38	21,263 26	3,589 50
1924-25.....	16,469 50		8,505 56	24,975 06	6,706 39
1925-26.....	18,156 07		6,873 95	25,030 02	6,066 35
1926-27.....	18,590 43		6,878 44	25,468 87	6,057 68
1927-28.....	19,593 93		7,792 50	27,386 43	6,274 24
1928-29.....	21,892 19		8,753 11	30,645 30	9,178 99
	387,945 25		126,644 15	514,589 40	90,729 60

*Includes Alberta.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE
SINCE 1906.

PROVINCE OF ALBERTA

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1906-07.....	3,681 45			3,681 45	2 50
1907-08.....	5,440 66			5,440 66	2 50
1908-09.....	5,714 00			5,714 00	915 00
1909-10.....	8,063 22			8,063 22	703 00
1910-11.....	10,739 86			10,739 86	698 50
1911-12.....	*			*	709 00
1912-13.....	*			*	
1913-14.....	*			*	
1914-15.....	*		5,608 42	5,608 42	6,102 50
1915-16.....	*		4,798 69	4,798 69	5,237 85
1916-17.....	15,086 14		4,543 09	19,629 23	5,970 40
1917-18.....	13,262 62		4,127 81	17,390 43	9,767 94
1918-19.....	50,267 84		4,920 96	20,188 80	10,288 15
1919-20.....	15,633 19		7,203 06	22,836 25	8,313 85
1920-21.....	12,700 20		8,617 04	21,317 24	8,693 75
1921-22.....	12,473 92		9,956 33	22,430 25	10,119 30
1922-23.....	13,690 46		6,552 84	20,243 30	11,947 80
1923-24.....	13,880 42		6,419 16	20,299 58	10,111 50
1924-25.....	16,431 37		5,280 07	21,711 44	12,708 13
1925-26.....	18,744 72		8,255 38	27,000 10	14,932 99
1926-27.....	21,391 73		8,345 03	29,736 76	20,233 41
1927-28.....	22,435 76		7,792 50	30,228 26	20,666 41
1928-29.....	23,768 45		58,736 67	92,505 12	19,219 37
	248,406 01		161,157 05	409,563 06	177,343 85

*Included in Saskatchewan.

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE
SINCE CONFEDERATION.

PROVINCE OF BRITISH COLUMBIA

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867.					
1868.					
1869.					
1870.					
1871.					
1872.					
1873.					
1874.					
1875.					
1876.					
1877.	635 00			635 00	
1878.	690 00			690 00	
1879.	1,423 73			1,423 73	
1880.	1,399 92			1,399 92	10 00
1881.	1,721 48			1,721 48	
1882.	1,599 08			1,599 08	672 50
1883.	1,599 92			1,599 92	790 00
1884.	2,231 97		3,704 31	5,936 28	127 50
1885.	1,437 13		11,873 17	13,310 30	365 50
1886.	1,878 53		5,405 87	7,284 40	922 50
1887.	5,860 72		4,623 35	10,484 07	943 50
1888.	3,661 83		5,653 90	9,315 73	6,934 55
1889.	4,333 63		4,933 26	9,266 89	6,416 00
1890.	3,634 41		4,202 61	7,837 02	11,367 50
1891.	4,320 53		3,339 51	7,660 04	12,914 02
1892.	6,158 17		2,896 57	9,054 74	8,192 48
1893.	5,490 60		3,630 68	9,121 28	40,264 00
1894.	5,283 21		3,273 10	8,556 31	25,337 90
1895.	6,218 74		2,869 19	9,087 93	23,517 25
1896.	6,226 77		2,817 02	9,043 79	26,410 75
1897.	8,841 64		2,840 62	11,682 26	39,888 82
1898.	8,508 79		2,389 46	10,898 25	47,864 75
1899.	8,459 47		3,736 14	12,195 61	45,801 75
1900.	13,662 17		2,741 88	16,404 05	53,195 35
1901.	17,886 36		17,709 77	35,596 13	52,960 35
1902.	18,660 73	40,122 50	20,508 57	79,291 80	41,178 65
1903.	17,808 45	36,239 02	23,275 29	77,322 76	43,015 62
1904.	15,133 65	33,083 19	25,040 81	73,257 65	56,904 34
1905.	16,631 37	42,104 39	61,675 57	120,411 33	47,436 00
1906.	30,141 35	54,113 76	83,687 16	167,942 25	51,532 50
1907.	20,381 97	34,228 34	39,379 94	93,990 25	29,903 95
1908-09.	55,951 00	86,151 00	64,149 57	206,251 57	39,251 65
1909-10.	44,799 61	306,185 98	66,847 35	417,832 94	41,864 80
1910-11.	99,794 13	80,532 84	97,848 04	278,175 01	45,846 70
1911-12.	43,265 00	133,558 00	75,907 00	252,730 00	44,898 51
1912-13.	110,779 22	221,061 83	68,719 37	400,560 42	48,824 50
1913-14.	129,393 33	501,715 55	83,123 10	714,231 98	52,835 50
1914-15.	227,807 84	153,082 83	77,340 42	458,231 09	41,423 95
1915-16.	112,827 34	138,594 96	66,071 97	317,494 27	46,862 54
1916-17.	106,861 03	109,234 29	55,615 62	271,710 94	47,327 84
1917-18.	123,295 97	117,621 80	54,359 16	295,276 93	53,515 21
1918-19.	138,876 49	104,048 17	59,048 99	301,973 65	59,349 94
1919-20.	176,973 35	243,141 41	111,918 01	532,032 77	270,698 41
1920-21.	188,597 86	393,096 67	130,421 69	712,116 22	233,282 04
1921-22.	137,662 63	382,272 93	134,628 71	654,564 27	153,904 33
1922-23.	137,343 43	304,771 79	113,437 53	555,552 75	223,657 57
1923-24.	131,580 83	297,600 19	121,182 83	550,363 85	122,435 24
1924-25.	128,897 11	273,227 13	124,025 49	526,149 73	86,218 79
1925-26.	167,560 18	255,491 62	126,095 12	549,146 92	117,755 80
1926-27.	211,667 84	276 838 74	108,987 77	597,494 35	116,072 66
1927-28.	218,889 30	331,157 07	112,532 65	662,579 02	53,377 01
1928-29.	161,380 06	329,488 09	123,217 69	614,085 84	44,546 67
	3,096,124 85	5,278,764 09	2,317,685 83	10,692,574 77	2,618,817 69

MARINE AND FISHERIES

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1900.

YUKON

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1900-01.....	1,159 81			1,159 81	406 00
1901-02.....	2,066 66			2,066 66	1,130 00
1902-03.....	1,522 00			1,522 00	320 00
1903-04.....	1,400 00			1,400 00	240 00
1904-05.....	1,400 00			1,400 00	340 00
1905-06.....	1,083 31			1,083 31	282 00
1906-07.....	1,030 35			1,030 35	173 00
1907-08.....	1,226 30			1,226 30	274 00
1908-09.....	1,019 00			1,019 00	228 00
1909-10.....	2,416 63			2,416 63	457 00
1910-11.....	1,984 95			1,984 95	907 50
1911-12.....	2,095 00			2,095 00	203 25
1912-13.....	1,909 83			1,909 83	342 00
1913-14.....	1,520 00			1,520 00	226 00
1914-15.....	2,158 80			2,158 80	304 00
1915-16.....	1,794 75			1,794 75	315 00
1916-17.....	1,482 65			1,482 65	275 00
1917-18.....	1,530 75			1,530 75	375 00
1918-19.....	531 50			531 50	425 00
1919-20.....	11 65			11 65	215 00
1920-21.....					280 00
1921-22.....					375 00
1922-23.....					320 00
1923-24.....					330 00
1924-25.....					340 00
1925-26.....					355 00
1926-27.....					350 00
1927-28.....					505 00
1928-29.....					415 00
	29,343 94			29,343 94	10,707 75

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1892.

NORTHWEST TERRITORIES

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1892-93.....	1,770 41			1,770 41	197 00
1893-94.....	3,143 94			3,143 94	211 14
1894-95.....	3,515 16			3,515 16	309 50
1895-96.....	2,963 02			2,963 02	586 50
1896-97.....	2,181 58			2,181 58	344 13
1897-98.....	2,324 66			2,324 66	393 87
1898-99.....	4,065 68			4,065 68	150 50
1899-00.....	3,848 25			3,848 25	1,522 50
1900-01.....	6,251 39			6,251 39	816 55
1901-02.....	5,928 22			5,928 22	950 07
1902-03.....	7,076 26			7,076 26	1,350 50
1903-04.....	7,317 49			7,317 49	922 50
1904-05.....	7,003 55			7,003 55	1,151 50
1905-06.....	11,124 22			11,124 22	868 97
	58,258 58			58,258 58	9,775 23

Note.—For Alberta and Saskatchewan subsequent to 1906 see separate statements for each.

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE.

HUDSON BAY DISTRICT

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1903-04.....					10 00
1904-05.....					10 00
1905-06.....					10 00
1906-07.....					10 00
1907-08.....					360 00
1908-09.....					20 00
1909-10.....					301 83
1910-11.....					100 00
					821 83

APPENDIX No. 9

LIST OF UNITED STATES FISHING VESSELS WHICH ENTERED
CANADIAN PORTS ON THE PACIFIC COAST DURING THE
YEAR ENDED DECEMBER 31, 1928

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
					cwt.
Ann.....	1	6	2	Shelter.....	
Alitak.....	9	14	4	Land fish, bait and ice.....	100
Anna J.....	12	22	6	".....	2,040
Augusta.....	13	19	5	".....	1,680
Atlantic.....	10	24	9	".....	2,240
Albatross.....	11	40	13	" , bait and ice.....	1,440
Arctic.....	5	29	7	" , water, fuel.....	340
Arrow.....	8	40	9	Land fish.....	2,100
Attu.....	4	37	10	".....	1,200
Alten.....	6	43	10	".....	2,580
Akutan.....	7	46	9	".....	2,200
Atlas.....	9	31	7	".....	2,100
Addington.....	10	26	6	".....	1,180
Actor.....	1	7	2	".....	20
Avona.....	1	9	3	".....	100
Alentian.....	8	36	13	" , bait and ice, orders, sick man.....	20
Arue.....	9	23	6	" , bait and ice, orders, sick man.....	80
Anna Helen.....	2	10	3	Water, engine trouble.....	
Aminca.....	1	25	11	Land fish.....	140
Angeles.....	8	28	6	Bait and ice.....	
Aloha.....	9	19	6	".....	
Antler.....	10	26	5	Land fish, bait.....	312
America.....	7	25	11	Bait and ice.....	
Arcade.....	10	14	4	".....	
Alice B.....	11	13	5	".....	
Argo.....	6	26	6	".....	
Alco.....	1	37	4	Cargo in transit.....	
Alo K. 431.....	2	4	1	Shelter.....	
Areturna.....	1	8	2	".....	
Bravo.....	7	14	3	Land fish.....	580
Betty.....	11	15	5	".....	1,280
Baltic.....	7	20	5	".....	1,080
Brothers.....	10	13	5	".....	1,320
Brunvoll.....	10	37	7	".....	2,220
Bonanza.....	6	30	6	".....	1,500
Brunvoll II.....	5	27	6	" , bait and ice, orders, in transit.....	80
Brisk.....	3	37	9	".....	820
Bolinda.....	7	22	6	" , bait and ice.....	640
Blanco.....	7	24	6	" , bait and ice.....	80
Betty Jane.....	6	34	7	" , bait and ice.....	40
Beaver.....	7	17	5	" , bait and ice.....	84
Bride.....	1	8	2	Shelter.....	
Bill II.....	1	4	9	".....	
Cedric.....	4	19	6	".....	450
Celtic.....	9	39	9	Land fish.....	2,520
Coolidge.....	9	32	6	".....	1,920
Constitution.....	9	39	13	".....	1,740
Chum.....	4	6	3	".....	320
Columbia.....	8	41	9	".....	2,340
Caroline.....	1	4	2	".....	40
Cora.....	10	4	2	".....	380
Chelsea.....	7	51	10	" , bait and ice.....	1,740
Charlotte.....	4	4	2	".....	180
Clipper.....	3	54	10	".....	1,560
California.....	8	20	5	Water, bait and ice.....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the
Pacific Coast During the Year Ended December, 31, 1928—*Continued*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
					cwt.
Corona.....	9	19	11	Bait and ice.....	
Curlew.....	10	18	5	" , shelter.....	
Chancellor.....	4	14	5	"	
C. 88 A.....	1	4	2	Shelter.....	
Discovery.....	12	10	4	Land fish, bait and ice, in transit orders.....	80
Defense.....	4	20	5	Land fish.....	520
Democrat.....	8	27	6	"	1,540
Doric.....	8	42	10	"	2,520
Daily.....	7	26	6	"	1,360
Dalco.....	2	4	2	"	80
Dorothy.....	1	98	11	Water.....	
Diana.....	11	22	6	Land fish, bait and ice, in transit, land sick man.....	120
Don Q.....	3	9	3	Land fish.....	200
Dove L. 747.....	1	3	1	Bait and ice.....	
Eldorado.....	10	47	10	Land fish.....	3,320
Eureka.....	14	11	4	"	1,040
Eureka.....	3	4	2	"	120
Eastern Point.....	14	4	3	"	660
Estep.....	6	26	6	" , water.....	260
Excel.....	9	27	6	"	1,660
Explorer.....	8	34	9	"	2,360
Electra.....	8	48	10	"	2,220
Eagle.....	9	66	10	"	2,760
Eidsøld.....	5	15	5	" , bait and ice.....	100
Emma.....	1	10	3	"	160
Evolution.....	9	17	5	" , bait and ice.....	60
Eclipse.....	16	44	11	Bait and ice, engine trouble.....	
Eleanora.....	1	16	5	"	
Ellas B.....	1	5	2	Stores.....	
Eddie.....	1	6	5	"	
Elsie.....	1	6	2	Shelter.....	
Foremost.....	7	66	10	Land fish.....	3,400
Flattery.....	8	10	3	"	560
Franklin.....	5	34	9	"	1,420
Fairway.....	9	19	5	" , bait and ice.....	380
Flamingo.....	3	13	5	"	20
Forward.....	10	18	5	Bait and ice, water.....	
Fremont.....	3	10	4	" land fish.....	34
Flint.....	8	24	6	Bait and ice.....	
Faith.....	13	7	3	Land fish, bait and ice.....	131
Forerunner.....	1	3	2	Bait and ice.....	
Falcon.....	1	8	2	Shelter.....	
Gloria.....	13	17	5	Land fish, water, bait and ice.....	420
Glacier.....	13	13	6	Land fish.....	1,600
Grayling.....	7	16	5	"	1,140
Gony.....	5	12	5	" , bait and ice.....	180
Garland.....	7	10	3	"	480
Grant.....	8	43	9	"	2,080
Gjoa.....	7	3	3	"	640
Gretchen.....	8	8	3	" , bait and ice.....	43
George T.....	1	6	2	Shelter.....	
Going.....	1	6	2	"	
Grant.....	1	5	2	"	
Hi Gill.....	10	12	4	Land fish.....	1,000
Hazel H.....	14	24	5	"	2,140
Hilda.....	8	10	3	"	450
Havana.....	8	41	10	"	2,140
Helgeland.....	7	56	10	"	1,520
Happy.....	6	12	4	"	800
Harding.....	7	19	6	" , bait and ice.....	200
Hyperian.....	1	10	3	"	120
Harding.....	1	11	5	Water.....	
H. A. 310.....	1	4	2	Shelter.....	
H. H. 18.....	1	4	1	"	
Hanna.....	1	11	5	"	
H. 563 A.....	1	4	3	"	
Ilene.....	11	33	7	Land fish, bait and ice.....	2,200
Irene.....	8	30	9	"	1,680
Ithona.....	8	20	6	"	1,380

LIST of United States Fishing Vessels Which Entered Canadian Ports on the Pacific Coast During the Year Ended December, 31, 1928—*Continued*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
Ivanhoe.....	6	27	7	Land fish, bait and ice.....	cwt. 960
Ionic.....	10	24	6	" , water, bait and ice.....	160
Imperial.....	2	23	4	" , bait and ice.....	200
Irene.....	1	5	2	Stores.....	
Inland.....	1	4	2	Shelter.....	
Ipswich.....	1	6	2	".....	
Jack.....	17	4	3	Land fish.....	720
June.....	6	15	5	" , bait and ice.....	160
J. P. Todd No. 11.....	10	12	5	".....	1,220
Jennie F. Decker.....	1	16	5	".....	11
J. H. F. No. 281 K.....	1	5	2	Repairs.....	
Kanatak.....	4	39	9	Land fish.....	760
Kanaga.....	9	47	9	".....	3,260
Kenebec.....	6	4	3	".....	420
Kodiak.....	7	38	13	" , water, bait and ice.....	540
Katalla.....	4	16	5	Bait and ice, stores, engine trouble..	
Koprino.....	1	49	5	Bait and ice.....	
Kinki.....	1	5	2	Stores.....	
K. C. Jones.....	1	6	3	".....	
K. 800.....	2	5	2	".....	
Kanaga Native.....	1	13	6	Engine trouble.....	
Kalart.....	1	6	2	Shelter.....	
Lumen.....	12	10	3	Land fish.....	1,020
Lancing.....	11	16	5	".....	1,400
Lindy.....	10	49	10	".....	2,780
Lenor.....	9	14	4	".....	1,240
Liberty.....	6	44	10	".....	1,320
Lituya.....	7	30	7	".....	1,260
Lovera.....	2	4	4	".....	100
Leviathan.....	8	29	6	".....	1,200
La Polama.....	5	14	11	" , bait and ice, stores.....	40
Lebanon.....	9	15	8	Land fish, bait and ice.....	20
Lillum M.....	1	9	3	Bait and ice.....	
L. 996.....	1	5	2	Stores.....	
Lulu 8694.....	1	4	2	Shelter.....	
Middleton.....	8	24	6	Land fish.....	1,260
Mitkof.....	5	42	9	".....	1,440
Majestic.....	9	33	16	".....	2,700
Mars.....	10	9	4	" , bait and ice.....	860
Marmot.....	7	30	9	".....	2,160
Mildred II.....	1	31	5	".....	60
Madeline J.....	8	25	5	" , bait and ice.....	120
Muria.....	2	27	5	".....	260
McKinley.....	4	38	10	".....	1,800
Mary.....	10	16	8	Bait and ice.....	
Merit.....	4	11	4	".....	
Minnie Berna.....	1	10	4	".....	
Mermaid.....	13	19	5	Land fish, bait.....	198
Mariner.....	10	21	5	Bait and ice.....	
Mildred.....	1	19	5	Repairs.....	
M. 3404.....	1	5	1	Engine trouble.....	
M. 663.....	1	5	1	Stores.....	
My own.....	1	14	3	".....	
Memories.....	1	8	2	Shelter.....	
Millers Bay.....	1	5	1	".....	
M. 3501.....	1	4	2	".....	
M. 177.....	1	3	2	Water.....	
North.....	11	35	10	Land fish.....	3,160
Northern.....	5	38	10	".....	840
Nordic.....	9	30	9	".....	2,280
Norland.....	6	19	6	".....	1,240
National.....	7	20	5	" , bait and ice.....	180
Nordby.....	7	40	9	" , water.....	1,520
Norma Jane.....	2	4	2	".....	40
Neptune.....	7	43	13	" , water, bait and ice.....	617
Nomad.....	2	15	4	Bait and ice, engine trouble.....	
Naomi.....	3	3	3	".....	
North.....	13	9	3	Land fish, bait and ice.....	14
Norma.....	1	6	2	Shelter.....	
Nebraska.....	1	5	2	".....	
Neoma M. 1516.....	1	3	3	".....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the Pacific Coast During the Year Ended December, 31, 1928—Continued

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
Omany 2.....	5	34	7	Land fish.....	cwt.
Onah 3.....	17	18	5	".....	1,260
Orient 4.....	8	48	13	" , bait and ice.....	2,040
Oceanus 1.....	12	26	6	Bait and ice, repairs.....	60
Polaris.....	8	45	9	Land fish.....	1,880
Panama.....	6	35	10	".....	1,780
Pacific.....	6	44	10	".....	2,400
Portlock.....	10	36	9	".....	2,760
Pierce.....	12	14	4	" , water.....	920
Prosperity.....	8	25	6	".....	1,600
Paragon.....	5	69	12	".....	1,980
Pegge.....	3	44	3	".....	240
Pioneer.....	6	48	10	".....	1,800
President.....	13	24	7	" , water, bait and ice, stores, engine trouble.....	320
Pioneer III.....	6	26	5	Land fish, bait and ice.....	
Presleo.....	13	14	5	Bait and ice, shelter, land fish.....	139
Pershing.....	1	18	5	Bait and ice.....	
Petrel.....	1	7	2	Shelter.....	
Polaris.....	1	4	2	".....	
Pacific H.A. 335.....	1	4	2	".....	
Pauline.....	1	6	2	".....	
Quin.....	1	5	2	Stores.....	
Reliance No. 1.....	9	19	5	Land fish.....	1,280
Reliance.....	12	14	4	".....	1,560
Reliance.....	9	8	3	".....	660
Resolute.....	8	47	9	".....	1,520
Rainier.....	14	4	3	".....	1,020
Rainier.....	9	39	9	".....	1,920
Radio.....	4	63	10	".....	1,080
Reform.....	3	6	5	".....	220
Rambler.....	4	10	3	".....	320
Rival.....	4	4	3	".....	340
Restitution.....	10	24	5	Water, bait and ice, stores.....	
Repeat.....	5	14	4	Bait and ice, shelter.....	
Reliance.....	4	11	3	" , land and fish.....	17
Republic.....	7	24	6	".....	
Roosevelt.....	4	51	13	".....	
Rosario.....	1	16	5	Land fish, bait and ice.....	60
Royal.....	2	15	5	Bait and ice.....	
Rakel.....	1	5	1	Engine trouble.....	
Ricarvon.....	1	6	3	Repairs.....	
Rose M.H. 376A.....	1	4	2	Shelter.....	
Red Star.....	1	19	2	".....	
Rebel.....	1	4	2	".....	
Star.....	9	12	3	Land fish.....	960
Sentinel.....	13	21	6	".....	2,580
Sherman.....	15	18	5	" , bait and ice.....	2,240
Summer.....	8	34	10	".....	2,100
Sitka.....	7	50	10	".....	2,360
Sunset.....	11	37	9	".....	2,460
Sirino.....	7	17	4	".....	760
Sund'E.....	1	36	9	".....	120
Superior.....	5	26	6	".....	1,040
Seymour.....	5	44	10	" , bait and ice.....	1,020
Seattle 6.....	7	55	11	".....	1,860
Senator.....	8	11	7	".....	1,680
Sea Bird 4.....	5	28	7	" , bait and ice.....	740
Spray.....	5	20	6	" , bait and ice.....	520
Sylvia.....	11	30	6	" , bait and ice engine trouble.....	120
Summit.....	10	21	6	Land fish, towing in transit.....	40
Sadie K2.....	2	16	5	Bait and ice.....	
Sammy 1.....	1	8	5	".....	
Selina J.....	11	9	4	" , shelter.....	
Superior.....	8	18	5	Land fish, bait and ice.....	102
Swing.....	1	5	2	Bait and ice.....	
Service.....	1	5	2	Stores.....	
Star.....	1	7	2	Engine trouble.....	
Starcol.....	1	20	5	In transit.....	
Sarah E. 3.....	1	7	2	Shelter.....	
Snark.....	1	7	2	".....	
Seaside 5.....	1	6	3	".....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the
Pacific Coast During the Year Ended December, 31, 1928—*Concluded*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
Teddy J. 4.....	13	13	5	Land fish.....	cwt. 1,980
Tyce 13.....	6	13	4	".....	780
Thelma M 5.....	7	7	3	".....	580
Thor 10.....	7	25	13	" , bait and ice.....	800
Thor 9.....	9	4	2	".....	460
Tahoma 2.....	13	18	7	".....	1,760
Tatoosh 3.....	4	26	6	".....	840
Trinity 12.....	5	41	10	" , bait and ice.....	880
T. 218 1.....	1	3	3	".....	60
Thelam II 6.....	7	26	6	" , bait and ice.....	140
Tordeus Kjold II.....	8	39	15	" , bait and ice stores.....	80
Texas 8.....	2	16	5	Bait and ice.....	
Templar 7.....	1	13	2	Shelter.....	
Unimak 3.....	7	10	3	Land fish.....	620
Urania 1.....	4	27	6	".....	450
Uranus 2.....	4	20	5	" , water, bait and ice stores.....	100
Unimak 4.....	11	22	8	Land fish, bait and ice.....	60
Viking 8.....	13	11	4	".....	930
Venus 7.....	9	25	8	".....	1,720
Venus 6.....	10	4	3	".....	720
Vausee 2.....	7	58	10	".....	1,760
Visitor 10.....	5	4	3	".....	220
Venture 5.....	4	36	7	".....	1,000
Viola 9.....	3	4	3	".....	200
Valero 1.....	8	6	3	" bait and ice.....	5
Volunteer 12.....	2	20	5	Bait and ice.....	
Vivian 11.....	4	9	3	" , shelter.....	
Ventura 3.....	1	6	2	Shelter.....	
Verna 4.....	1	5	2	".....	
Woodrow 12.....	6	23	5	Land fish, water, bait and ice.....	140
Wizard 11.....	5	49	9	Land fish.....	1,780
Western 6.....	7	41	9	".....	1,540
Wabash 2.....	16	6	3	".....	880
Wenterslad 4.....	1	9	2	".....	40
Wave 1.....	10	7	3	" , water.....	450
Wireless 10.....	18	19	6	" , bait and ice.....	180
Wilson 9.....	1	19	5	".....	100
Westfjord 3.....	3	17	5	Bait and ice, water.....	
White Star 8.....	11	17	5	Bait and ice.....	
Wesley 5.....	10	9	3	".....	
White Star No. 2.....	1	4	2	Shelter.....	
White Star 7.....	3	5	3	Bait.....	
Yakutat 4.....	9	41	10	Land fish.....	2,160
Yukon 6.....	7	31	6	".....	1,360
Yellowstone 5.....	2	22	6	".....	360
Yakutat 3.....	1	50	11	Bait and ice.....	
Yaquina 2.....	7	29	6	".....	
Yakina I.....	1	5	2	On way north.....	
Zenith 1.....	6	47	9	Land fish.....	1,020

APPENDIX No. 10

LIST OF UNITED STATES FISHING VESSELS WHICH ENTERED
CANADIAN PORTS ON THE ATLANTIC COAST DURING
THE YEAR ENDED DECEMBER 31, 1928

Name of vessel	Number of times entered	Tonnage	Number of crew	Reason for entry	Quantity of fish landed, if any lbs.
Acushla.....	4	70	23	Shelter.....	
Alden.....	3	44	14	To purchase a boat, shelter.....	
Amia and Ella.....	15	27	8	Shelter.....	
American.....	2	63	23	".....	
A. Pratt Andrew.....	1	33	7	".....	
Aeolus.....	7	16	8	".....	
Annie Ellen.....	1	27	8	".....	
Angie L. Marshall.....	1	56	21	".....	
Benjamin M. Wallace.....	1	49	16	Repairs.....	
B. T. Heilman.....	1	17	7	Water.....	
Barbara.....	12	9	8	Shelter.....	
Bernice and Bessie.....	14	27	7	Shelter and repairs.....	
B. T. Hillman.....	7	17	8	".....	
Catherine.....	1	77	27	Repairs and shelter.....	
Col. Lindberg.....	2	28	11	Shelter.....	
Col. Lindberg.....	7	41	9	".....	
Dawn.....	6	79	27	Shelter and sick man.....	
Desire.....	7	21	8	Shelter.....	
Desire.....	1	36	8	".....	
Dawn.....	1	71	27	".....	
Elsie.....	6	66	21	".....	
Eleanor Nickerson.....	1	113	27	".....	
Elk.....	6	66	21	".....	
Ellen T. Marshall.....	4	75	25	".....	
Edith C. Rose.....	3	70	21	".....	
Elizabeth A.....	2	34	8	".....	
Elizabeth A.....	12	6	8	".....	
Elizabeth A.....	2	24	8	".....	
Elmer E. Gray.....	71	23	3	".....	
Ethel B. Penny.....	2	56	22	".....	
Elizabeth W. Nunan.....	2	48	20	".....	
Fannie Belle.....	1	19	7	".....	
Funchal.....	10	20	9	".....	
Flora L. Oliver.....	5	59	21	".....	
Gertrude De Costa.....	12	61	19	Shelter, water, land sick man.....	
Governor Foss.....	6	88	20	Shelter, land sick man.....	
Governor Prince.....	2	56	13	Shelter.....	
Gossoon.....	3	51	27	Shelter, supplies, home voyage.....	
Grand Marshall.....	6	70	27	Shelter, water.....	
Glossow.....	1	51	26	Shelter, land sick man.....	
Gladys L'Creamer.....	7	16	7	Shelter.....	
Glener.....	1	38	15	".....	
Henry Ford.....	1	92	25	".....	
Herbert Parker.....	3	78	23	" , land sick man.....	
Huntington Sandford.....	12	22	8	".....	
Hazel M. Jackson.....	11	26	8	".....	
Imperator.....	9	79	21	" , repairs.....	
Isabelle Parker.....	1	48	27	".....	
Irene and Mabel.....	9	41	10	".....	
Isabella.....	7	11	8	".....	
Ingomar.....	1	85	22	".....	
Isabel M.....	1	13	8	".....	
Isabelle.....	1	34	8	".....	
Josephine DeCosta.....	1	60	20	".....	
John A. Cooney.....	7	14	8	" , water.....	
John T. Fallon.....	2	60	23	".....	
Joffre.....	7	80	23	" , repairs.....	
J. M. Marshall.....	3	60	22	".....	
Killarney.....	6	73	18	" , reporting lost man and obtaining fuel oil.....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the Atlantic Coast During the Year Ended December 31, 1928—*Concluded*

Name of vessel	Number of times entered	Tonnage	Number of crew	Reason for entry	Quantity of fish landed, if any
Katherine Burke.....	1	68	15	Shelter.....	lbs.
Lark.....	2	127	27	".....	
Laura Goulart.....	16	73	21	".....	
L. A. Dunton.....	7	94	25	" , land sick man.....	
Lincoln.....	9	42	15	Shelter, purchase fuel oil for home voyage.....	
Louisa R. Sylva.....	1	92	8	Shelter and land sick man.....	
Louise B. Marshall.....	5	74	19	Repairs, and to take on board and convey to U.S. salvaged equipment from wreck of Gov. Marshall	
Mary E. O'Hara.....	9	49	23	Shelter.....	
Mary F. Ruth.....	1	33	7	Repairs to lighting system.....	
Mary Sears.....	4	61	19	Shelter, repairs.....	
Mao IV.....	1	53	6	Shelter, water.....	
Mary A.....	6	17	8	Shelter.....	
Mildred Robinson.....	1	73	7	".....	
Morning Star.....	2	57	23	".....	
Mercedes.....	11	11	7	" , repairs.....	
Mary M.....	16	20	8	".....	
Mary and Ruth.....	1	33	7	".....	
Minnie M.....	13	28	8	".....	
Mabel E. Bryson.....	8	23	7	".....	
Madeline and Flora.....	1	43	7	".....	
Mary and Ruth.....	1	33	7	" , destroyed by fire while in port.....	
Natalie Hammond.....	5	51	23	Shelter.....	
Notus.....	4	14	4	" , repairs.....	
Nickerson.....	12	23	8	" , water.....	
Newcastle.....	8	19	8	".....	
Oretha F. Spinney.....	2	65	11	".....	
Pilgrim.....	3	52	22	".....	
Patara.....	1	152	7	".....	
Philip P. Mantha.....	1	61	22	".....	
Paolina.....	1	19	12	".....	
Provendiza II.....	2	18	11	".....	
Ruth and Margaret.....	5	62	23	Engine repairs, shelter.....	
Rhodora.....	1	70	19	Shelter.....	
Richard J. Nunan.....	3	55	13	".....	
Rita Aviator.....	3	22	12	".....	
Shamrock.....	2	68	27	".....	
Squanto.....	4	81	8	".....	
Sunapee.....	14	18	9	".....	
Stranger.....	1	22	12	".....	
Thos. S. Gorton.....	1	92	7	".....	
Teazer.....	1	59	22	".....	
Teaser.....	2	97	20	".....	
Thelma.....	1	28	12	".....	
Virginia.....	9	30	17	" , repairs.....	
Virginia R.....	3	51	6	".....	
Wanderer.....	2	132	28	" , repairs.....	
Waltham.....	13	44	10	".....	
William Landry.....	15	13	7	".....	
Yankee.....	6	71	23	" , repairs and repairs to rudder	
Zilpha.....	11	13	7	" , repairs.....	

APPENDIX No. 11

The following is a statement of the different kinds of licenses issued by the several supervisors, during the 1928-29 season:—

MAGDALEN ISLANDS, QUEBEC—SUPERVISOR S. T. GALLANT

Kind of Licenses—	Number of Licensed Issued
Lobster fishing licenses.....	682
Lobster packing licenses.....	16
Lobster packing extensions—10	
Fish cannery licenses.....	1
Certificates under section 66—3	
Herring seine licenses.....	20
Herring trap-net licenses.....	27 (6 Cod Trap-nets)
Smelt gill-net licenses.....	7
Smelt bag-net licenses.....	2
	<hr/>
	755 (6 Cod Trap-nets)

PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

Lobster fishing licenses.....	1,878
Lobster packing licenses.....	103
Lobster packing extensions—54	
Oyster fishery licenses.....	223
Quahaug fishery licenses.....	26
Fish cannery licenses.....	20
Certificates under Section 66—7	
Reduction Works licenses.....	Nil
Trap-net fishing licenses.....	4
Scallop fishery licenses.....	3
Lobster pound licenses.....	1
Smelt gill-net licenses.....	324
Smelt bag-net licenses.....	249
	<hr/>
	2,831

NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Lobster fishing licenses.....	2,023
Lobster packing licenses.....	43
Lobster packing extensions—45	
Oyster fishery licenses.....	111
Fish cannery licenses.....	4
Certificates under Section 66—67 (1 cancelled).	
Reduction works licenses.....	Nil
Herring weir licenses.....	3
Trap-net fishing licenses.....	40
Salmon gill-net or drift-net licenses.....	40
Salmon trap-net, pound-net or weir licenses.....	197
Special angling permits.....	131
Lobster pound licenses.....	Nil
Smelt bag-net licenses.....	23
Smelt gill-net licenses.....	196
	<hr/>
	2,811

NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR D. H. SUTHERLAND

Lobster fishing licenses.....	3,268 (4 cancelled)
Lobster packing licenses.....	48
Lobster packing extensions—75	
Oyster fishery licenses.....	85
Quahaug fishery licenses.....	2
Shad gill-net or drift-net licenses.....	6
Fish cannery licenses.....	6
Certificates under Section 66—100 (1 cancelled)	
Reduction works licenses.....	3
Seine licenses.....	132
Herring weir licenses.....	13
Trap-net fishing licenses.....	95
Salmon gill-net or drift-net licenses.....	399 (1 cancelled)
Salmon trap-net, pound-net or weir licenses.....	174 (5 can. and 1 des.)
Special angling permits.....	75
Scallop fishery licenses.....	Nil
Lobster pound licenses.....	6
Smelt bag-net licenses.....	207
Smelt gill-net licenses.....	268 (3 cancelled)
Lobster pound certificates—193 (1 cancelled)	
	<hr/>
	4,787 (13 can. and 1 des.)

NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

Kind of Licenses— <i>Continued</i>	Number of licenses issued
Lobster fishing licenses.....	3,303 (4 cancelled)
Lobster packing licenses.....	24
Lobster packing extensions—14	
Shad gill-net or drift-net licenses.....	3
Fish cannery licenses.....	11
Certificates under Sec. 66—176 (1 can. and 1 des.)	
Reduction works licenses.....	10
Herring weir licenses.....	63
Trap-net fishing licenses.....	129
Salmon gill-net or drift-net licenses.....	312
Salmon trap-net, pound-net or weir licenses.....	64
Salmon net permits.....	40
Special angling permits.....	756
Scallop fishery licenses.....	197 (4 cancelled)
Lobster pound licenses.....	13 (2 cancelled)
Smelt bag-net licenses.....	22
Smelt gill-net licenses.....	73
Lobster pound certificates—182 (1 cancelled).	
	<hr/> 5,020 (10 cancelled)

NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR H. E. HARRISON

Shad gill-net or drift-net licenses.....	270
Sturgeon fishery licenses.....	10
Whitefish fishery licenses.....	14
Salmon net permits.....	159
Gaspereau pound-net or trap-net licenses.....	8
Salmon gill-net or drift-net licenses.....	122
Salmon trap-net, pound-net or weir licenses.....	102
Bass fishery licenses.....	36
Smelt gill-net licenses.....	1
Smelt bag-net licenses.....	Nil
	<hr/> 722

NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

Lobster fishing licenses.....	520
Shad gill-net or drift-net licenses.....	50
Fish cannery licenses.....	9
Certificates under Section 66—3.	
Reduction works licenses.....	4
Herring weir licenses.....	653
Clam permits.....	101
Salmon gill-net or drift-net licenses.....	91
Herring seine licenses.....	15
Scallop fishery licenses.....	3
Lobster pound licenses.....	6
Smelt gill-net licenses.....	Nil
Smelt bag-net licenses.....	Nil
Lobster pound-certificates—245	
Lease of Dark harbour fishing privileges—1	
	<hr/> 1,452

NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

Lobster fishing licenses.....	1,981
Lobster packing licenses.....	103 (1 cancelled)
Lobster packing extensions—43	
Oyster fishery licenses.....	959
Quahaug fishery licenses.....	85
Fish cannery licenses.....	7
Certificates under Section 66—206	
Reduction works licenses.....	Nil
Herring weir licenses.....	Nil
Gaspereau pound-net or trap-net licenses.....	45
Salmon gill-net or drift-net licenses.....	111
Salmon trap-net, pound-net or weir licenses.....	395
Scallop fishery licenses.....	Nil
Bass fishery licenses.....	49
Smelt gill-net licenses.....	209
Smelt bag-net licenses.....	6,107
Lobster pound licenses.....	3
Lobster pound certificates—414 (1 cancelled).	
	<hr/> 10,054 (1 cancelled)

MANITOBA—SUPERVISOR J. B. SKAPTASON

Kind of Licenses— <i>Concluded</i>	Number of licenses issued
Special angling permits.....	1,143
Pound-net licenses.....	16
Special fishery licenses.....	3,958 (3 cancelled)
Reduction works licenses (issued by R.C.M.P. Pangnirtung).....	1
Settlers' permits.....	1,177
Commercial sturgeon fishery licenses.....	30
Domestic sturgeon fishery licenses.....	Nil
Receipt books—74	
	6,325 (3 cancelled)

SASKATCHEWAN—SUPERVISOR G. C. MACDONALD

Special angling permits.....	351 (1 cancelled)
Commercial and fisherman's fishery licenses.....	1,138 (19 cancelled)
Domestic fishery licenses.....	180 (4 cancelled)
Indian and half-breed permits.....	950
Commercial sturgeon fishery licenses.....	Nil
Domestic sturgeon fishery licenses.....	Nil
	2,619 (24 cancelled)

ALBERTA—SUPERVISOR R. T. RODD

Fish cannery licenses.....	1
Special angling permits.....	5,844 (5 cancelled)
Indian and half-breed permits.....	976
Commercial and fisherman's fishery licenses.....	1,143 (2 cancelled)
Domestic fishery licenses.....	286 (2 cancelled)
Pound-net licenses.....	1
Receipt books.—877 (15 cancelled)	
	8,251 (9 cancelled)

BRITISH COLUMBIA—SUPERVISOR J. A. MOTHERWELL

Fish cannery licenses.....	5
Reduction works licenses.....	26
Special angling permits (per annum).....	39 (8 cancelled)
Special angling permits (per diem).....	207 (1 cancelled)
Abalone fishery licenses.....	1
Indian Permits.....	924 (13 cancelled)
Metal tags—795	
Crab fishery licenses.....	140
Smelt or Sardine fishery licenses.....	75
Sturgeon fishery licenses.....	Nil
Miscellaneous licenses.....	176
Salmon fishery licenses.....	4,463 (7 cancelled)
Salmon trolling licenses.....	2,943 (2 cancelled)
Salmon trap-net licenses.....	7
Salmon purse-seine licenses.....	353 (4 cancelled)
Salmon drag-seine licenses.....	22
Licenses to a captain of a salmon (purse or drag) seine boat.....	278 (7 cancelled)
Salmon curing licenses.....	33
Salmon cannery licenses.....	76
Boat license to buy fresh salmon from fishermen.....	233 (4 cancelled)
License to a person engaged in cold storage or fish packing to buy fresh salmon from fishermen.....	74
Grayfish fishery licenses.....	420
Licenses to assistant operator of salmon (purse or drag) seine used under license.....	1,725 (3 cancelled)
Licenses to assistant in a boat used in operating a salmon gill-net or drift-net.....	997
Cod fishery licenses.....	443
Herring or pilchard gill-net or drift-net licenses.....	39
Herring or pilchard purse seine licenses.....	118 (1 cancelled)
Herring or pilchard drag seine licenses.....	2
Herring pound licenses.....	Nil
License to a captain of a herring or pilchard seine boat.....	102
Herring curing licenses.....	33
Licenses to assistant operator of a herring or pilchard purse seine.....	936
Whale factory licenses.....	2
Counterfoil of pelagic sealing certificates—19	
	14,892 (50 cancelled)

YUKON

Special fishery licenses.....	26
-------------------------------	----

PACIFIC COAST

Licenses to United States fishing vessels.....	246
--	-----

Total..... 60,791 (110 can. and 1 des.)

APPENDIX No. 12

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29

NOVA SCOTIA —DISTRICT No. 1—SUPERVISOR, A. G. McLEOD

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Norman Melver.....	Illegal fishing of trout.....	Hazeldale Pond, Vic. Co.....	Fined \$15 and costs. Confiscation of 1 herring net and 8 trout.
2	Pascal LeBlanc.....	Illegal fishing of lobsters.....	Alder Point, C.B.....	Fined \$5 and costs.
3	Nathias Dugast.....	Illegal fishing of lobsters.....	Alder Point, C.B.....	Fined \$5 and costs.
4	Robert McAulay.....	Illegal fishing of lobsters.....	Homeville, C.B.....	Fined \$5 each, suspended sentence.
	John McAulay.....	Illegal fishing of lobsters.....	Homeville, C.B.....	Fined \$5 each, suspended sentence.
	Benjamin Wadden.....	Illegal fishing of lobsters.....	Homeville, C.B.....	Fined \$5 each, suspended sentence.
	Harvey Boutillier.....	Illegal fishing of lobsters.....	Homeville, C.B.....	Fined \$5 each, suspended sentence.
5	Walter Shea.....	Illegal fishing of lobsters.....	Alder Point, C.B.....	Fined \$5 and costs.
6	Alex. McDonald.....	Illegal fishing of lobsters.....	Judique North, C.B.....	Fine—nil. Costs \$1 paid by defendant.
7	Angus McDonald.....	Illegal fishing of lobsters.....	Judique North, C.B.....	Fine—nil. Costs \$1 paid by defendant.
8	Godfrey Barron.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	Mick Barron.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	James Hawley.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	Murray Hawley.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	John W. Hawley.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	Archie McIntyre.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
	William Donovan.....	Setting lobster gear before the season opened.....	Ingonish, C.B.....	Fined \$10 suspended sentence for 2 years and costs.
9	Isiah LeBlanc.....	Illegal fishing of lobsters.....	Florence, C.B.....	Fined \$100 (suspended sentence) and costs.
10	Maurice Philips.....	Having illegally caught salmon in his possession.....	Sydney, N.S.....	Fined \$5 costs \$2 and had confiscated from him 23½ lbs. Salmon.
11	Michael Cameron.....	Obstructing overseer Murphy while discharging his duties.....	Margaree Forks, C.B.....	Fined \$100 or three months in jail, and costs.
12	James McNeil.....	Illegal fishing of salmon.....	Margaree River, Inv. Co.....	Fined \$30 or 2 mos. in jail and costs \$23.
13	Ronald McDonald.....	Water pollution.....	Mull River, Inv. Co.....	Fined \$20 or 10 days in jail and costs.

NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR, D. H. SUTHERLAND

1	I. Alvin Reid.....	Sawdust pollution.....	Little River, N.S.....	Fined \$20 and costs.
2	E. Maloney.....	Setting lobster gear before opening of season.....	Roy's Island.....	Fined \$20 and costs.
3	Roy Weatherby.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$5 and costs.
4	Roy Langille.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$15 and costs.
5	John Drummond.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$15 and costs.
6	George Tarterie.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$15 and costs.
7	George Langille.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$15 and costs.
8	Harold Smith.....	Leaving shore for fishing ground before 6 a.m.....	Malagash Point.....	Fined \$15 and costs.
9	Allie Allan.....	Offering for sale fragments of lobsters.....	Skinner's Cove.....	Fined \$5 and costs.
10	George Clarke.....	Having berried lobsters in possession.....	Wallace.....	Fined \$5 and costs.
11	Ellsworth Porter.....	Illegal fishing of lobsters.....	Gulf Shore.....	Fined \$25 and costs.
12	Tucker Martell.....	Leaving shore for fishing grounds before 6 a.m.....	Saddle Island.....	Fined \$25 and costs.
13	Daniel MacIntosh.....	Dynamiting of Liscomb River.....	Liscomb River.....	Fined \$15 and costs.
14	Thomas Waddell, Jr.....	Illegal fishing of trout.....	South Brook, Harrison's Lake.....	Case dismissed.
15	Thomas Waddell, Sr.....	Illegal fishing of trout.....	South Brook, Harrison's Lake.....	Fined \$5 and costs.
16	Percy Ripley.....	Illegal fishing of trout.....	South Brook, Harrison's Lake.....	Fined \$5 and costs.
17	Calvin Siddall.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$5 and costs.
18	Frank Blair.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
19	Eugene Atkinson.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
20	George Gilroy.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
21	Duncan McNeill.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
22	Ronald Thompson.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
23	William Older.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
24	James Warren.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
25	Roy Skidmore.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
26	Chas. Ryan.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
27	Richard J. Stuart.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
28	Richard Stuart.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
29	John L. Moore.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
30	Neil White.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
31	William Byard.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
32	Benjamin Brooks.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
33	Daniel Ross.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
34	Jack Melsaac.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
35	Joseph Melanson.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
36	Joseph Murphy.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
37	Joseph Murphy.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.
38	Joseph Murphy.....	Illegal fishing of salmon.....	South Brook, Harrison's Lake.....	Fined \$10.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—Continued

NOVA SCOTIA—DISTRICT No. 2—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
39	James Francis.....	Unlawfully obstructing guardian.....	Fishway, near Oxford.....	Fined \$100 and costs or 1 month in jail.
40	N. W. King.....	Illegal fishing of salmon.....	Near Oxford.....	Fined \$4 and costs.
41	Lewis Thornewaite.....	Illegal fishing of salmon.....	Near Oxford.....	Fined \$4 and costs.
42	Harold Young.....	Illegal fishing of salmon.....	West River.....	Fined \$40 and costs.

NOVA SCOTIA DISTRICT No. 3—SUPERVISOR, H. H. MARSHALL

1	Rodrick Ham.....	Illegal fishing of salmon.....	Mosher's Falls, Gold River.....	Fined \$10 and costs.
2	George Muise.....	Illegal fishing of gaspereau.....	Tusket's Falls, Tusket River.....	Fined \$5 and costs.
3	Aubrey Penall.....	Illegal fishing of salmon.....	Plymouth Stump, Gold River.....	Case dismissed.
4	John B. Hatt.....	Preparing to fish for salmon.....	Plymouth Stump, Gold River.....	Case dismissed.
5	Stuart Whynot.....	Illegal fishing of salmon.....	LaHave River.....	Fined \$25 and costs.
6	Ernest Weagle.....	Illegal fishing of salmon.....	LaHave River.....	Fined \$25 and costs or 20 days in jail.
7	Ernest Weagle.....	Illegal fishing of salmon.....	LaHave River.....	Fined \$25 and costs or 20 days in jail.
8	Willet Conrad.....	Illegal fishing of salmon.....	Rose Bay.....	Fined \$10 and costs.
9	Edward Albright.....	Illegal fishing of lobsters.....	Freepoint.....	Fined \$5.25 and costs.
10	John Albright.....	Illegal fishing of lobsters.....	Freepoint.....	Fined 5.25 and costs.
11	Emerson Albright.....	Illegal fishing of lobsters.....	Freepoint.....	Fined \$5.25 and costs.
12	William Albright.....	Illegal fishing of lobsters.....	Freepoint.....	Fined \$5.25 and costs.
13	Charles North.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 suspended sentence 2 yrs. and had confiscated 1 net.
14	Bert Harte.....	Illegal fishing of shad.....	Annapolis River.....	Case dismissed.
15	Russel Keddy.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 suspended sentence 2 yrs. and had confiscated from him 1 dip net.
16	Merlin Whitman.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 suspended sentence 2 yrs. and had confiscated from him 1 dip net.
17	Harold Minard.....	Illegal fishing of shad.....	Annapolis River.....	Case dismissed.
18	Reginald Stoddart.....	Illegal fishing of shad.....	Annapolis River.....	Case dismissed.
19	Ronald Schaffner.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 and costs. Suspended sentence for 2 years.
20	John Balson.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 and costs. Suspended sentence for 2 years.
21	Reginald Stoddart.....	Illegal fishing of shad.....	Annapolis River.....	Fined \$25 and costs. Suspended sentence for 2 years.
22	Stephen Labradore.....	Illegal fishing of salmon.....	LaHave River.....	Fined \$12 and costs.
23	Stephen Labradore.....	Obstructing fishery overseer while performing his duties.....	LaHave River.....	Sentenced to 25 days imprisonment.
24	Leander Levy.....	Illegal fishing of lobsters.....	Lunenburg.....	Fined \$5 and costs.

PRINCE EDWARD ISLAND—SUPERVISOR, S. T. GALLANT

1	Peter MacMahon.....	Having smelts in possession.....	New Annan, Prince Co.....	\$1.
2	John Reeves.....	Having smelts in possession.....	New Annan, Prince Co.....	\$1.
3	Philip Gain.....	Having lobsters in his possession in close season.....	Alberton Bay.....	\$20 and had confiscated from him 15 traps, 130 fms. rope.
4	Denzie Smith.....	Having lobsters in his possession in close season.....	Alberton Bay.....	\$60 or 30 days in jail.
5	John Skerry.....	Having lobsters in his possession in close season.....	Alberton Bay.....	\$60 or 30 days in jail.
6	Alfred Powers.....	Having lobsters in his possession in close season.....	Alberton Bay.....	\$60 or 30 days in jail.
7	Waldo Matthews.....	Having lobsters in his possession in close season.....	Alberton Bay.....	\$50 and had confiscated from him 1 case of lobsters.
8	Patrick Prille.....	Having lobsters in his possession in close season.....	Campbellton.....	\$60 or 30 days in jail.
9	Lloyd Cook.....	Having lobsters in his possession in close season.....	Cape Wolfe.....	\$60 and costs \$21.35 or 30 days in jail.
10	Jerome Doucette.....	Having lobsters in his possession in close season.....	Pleasant View.....	\$60 and costs or 30 days in jail and had confiscated from him 1 boiler, 7 pans, 1 set of scales and 1 closing machine.
11	Wilfrid Doucette.....	Having lobsters in his possession in close season.....	Pleasant View.....	\$60.
12	Claud Cormier.....	Having lobsters in his possession in close season.....	Pleasant View.....	\$50, and costs or 30 days in jail and confiscation of 1 case of lobsters.
13	Wm. Arsenault.....	Having lobsters in his possession in close season.....	Lot 15.....	\$50 and costs or 30 days in jail and had confiscated from him 1 1/4 cases of lobsters.
14	Reginald McHugh.....	Having lobsters in his possession in close season.....	Norway.....	\$60 and costs or 30 days in jail and had confiscated from him 70 cans of lobsters
15	Gratton McHugh.....	Having lobsters in his possession in close season.....	Norway.....	\$60 and costs or 30 days in jail and had confiscated from him 1 1/4 cases of lobsters.
16	James Monaghan.....	Having lobsters in his possession in close season.....	Campbellton.....	\$45 and costs \$5 or 30 days in jail.
17	Fraser Coughlin.....	Having lobsters in his possession in close season.....	Campbellton.....	\$60 and costs \$35.20 or 60 days in jail.
18	John H. Coughlin.....	Having berried lobsters in his possession.....	Campbellton.....	\$10 and costs of court or 15 days in jail.
19	Lawrence Murphy.....	Having berried lobsters in his possession.....	Campbellton.....	\$10 and costs of court or 15 days in jail.
20	Fred Jay and Patrick Kelly.....	Fishing smelt bag-net in the span of bridge.....	Pisquid Bridge.....	\$2 and had confiscated from him 1 smelt bag-net.

NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR, J. F. CALDER

1	Alphonse Belliveau.....	Allowing sawdust to enter Hallas Creek.....	Stilesville.....	\$20.
2	L. Cronk.....	Having illegal lobsters in his possession.....	Seal Cove, Grand Manan.....	\$10 and had confiscated from him 36 illegal lobsters.
3	Emery Forsythe.....	Having illegal lobsters in his possession.....	Seal Cove, Grand Manan.....	\$25 and had confiscated from him 21 illegal lobsters.
4	Roy Mack.....	Having illegal lobsters in his possession.....	Seal Cove, Grand Manan.....	\$25 and had confiscated from him 20 illegal lobsters.
5	Hatzell Cronk.....	Having illegal lobsters in his possession.....	Seal Cove, Grand Manan.....	\$25 and had confiscated from him 14 illegal lobsters.
6	Eugene Wilcox.....	Having illegal lobsters in his possession.....	Near Wood Island.....	\$25 and had confiscated from him 76 illegal lobsters.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—Continued
NEW BRUNSWICK—DISTRICT No. 1—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
7	Chas. Ramsdell	Having illegal lobsters in his possession	Near Wood Island	\$25.00 and had confiscated from him 26 illegal lobsters.
8	Lloyd Benson	Having illegal lobsters in his possession	Near Seal Cove	\$30.00 and had confiscated from him 22 illegal lobsters.
9	Joseph Morehouse	Having illegal lobsters in his possession	Near Whitehead	\$25.00 and had confiscated from him 22 illegal lobsters.
10	Harley Small	Having illegal lobsters in his possession	Near Seal Cove	\$15.00 and had confiscated from him 35 illegal lobsters.
11	Murray Stackhouse	Fishing during Sunday close time period	St. John Harbour	\$10.00.
12	Arthur Croft	Fishing during Sunday close time period	St. John Harbour	\$10.00.
13	Peter McDade	Fishing during Sunday close time period	St. John Harbour	\$10.00.
14	Paul McDade	Fishing during Sunday close time period	St. John Harbour	\$10.00.
15	Anthony Belyea	Fishing during Sunday close time period	St. John Harbour	\$10.00.
16	Chas. E. Sweet	Fishing during Sunday close time period	St. John Harbour	\$10.00.
17	Ouriel Hamm	Fishing during Sunday close time period	St. John Harbour	\$10.00.
18	Alex. Thompson	Fishing during Sunday close time period	St. John Harbour	\$10.00.
19	Fred Belyea	Fishing during Sunday close time period	St. John Harbour	\$10.00.
20	Scott Ingalls	Having illegal lobsters in his possession	Ingall's Head, Grand Manan	\$25.00 and had confiscated from him 38 illegal lobsters.
21	Chester Guptill	Having illegal lobsters in his possession	Ingall's Head, Grand Manan	\$25.00 and had confiscated from him 38 illegal lobsters.
22	Gordon Tippets	Fishing during Sunday close time period	St. John Harbour	\$10.00.
23	Hazen Lord	Having illegal lobsters in his possession	Near Adam's Isl'd	\$25.00 and had confiscated from him 3 traps and 5 lobsters.
24	James Jennings	Using net in non-tidal waters without permit	New River, Char. Co.	\$20.00 and confiscated from him 1 small net and 1 salmon.
25	Chas. Murray	Using net in non-tidal waters without permit	New River, Char. Co.	\$20.00 and confiscated from him 1 small net and 1 salmon.
26	Bibber Stuart	Catching herring by means of seine within 3 miles of shore.	West Isles, Char. Co.	\$20.00.
27	Chauncey Stuart	Catching herring by means of seine within 3 miles of shore.	West Isles, Char. Co.	\$20.00.
28	Albert Jones	Allowing buckwheat hulls to enter Petitcodiac River.	River Glade	\$20.00.
29	Thomas Hamilton	Using a net in non-tidal waters without a permit from the Minister.	Leamon Pool, Coverdale River.	\$20.00 and had confiscated from him 1 salmon net.
30	Bertram Forse	Using a net in non-tidal waters without a permit from the Minister.	Leamon Pool, Coverdale River.	\$20.00 and had costs \$4.85.
31	Kenneth Steeves	Using a net in non-tidal waters without a permit from the Minister.	Leamon Pool, Coverdale River.	\$20.00 and costs \$4.85.

32	Donald Steeves.....	Fishing for salmon other than angling.....	Leaman Bridge, Coverdale River.....	\$20.00.
33	John Blakeney.....	Fishing for salmon other than angling.....	Blakeney Farm, Coverdale River.....	\$20.00 and costs \$12.80 and had confiscated from him 1 salmon spear.
34	Walter Messineff.....	Fishing for trout through the ice.....	Lake Utopia, Char. Co.....	\$25.00 and costs \$2.50 and had confiscated from him 8 set lines and 3 trout.
35	John Armstrong.....	Fishing for trout through the ice.....	Lake Utopia, Char. Co.....	\$25.00 and costs \$2.50 allowed to stand. And had confiscated from him 8 set lines and 3 trout.
36	James McCartney.....	Fishing for trout through the ice.....	Lake Utopia, Char. Co.....	\$25.00 and costs \$2.50 allowed to stand. And had confiscated from him 8 set lines and 3 trout.
37	B. Armstrong.....	Fishing for trout through the ice.....	Lake Utopia, Char. Co.....	\$25.00 and costs \$2.50 allowed to stand. And had confiscated from him 8 set lines and 3 trout.
38	Ralph J. Doyle.....	Fishing for trout through the ice.....	Pocologan Lake.....	\$25.00 and costs \$6.36. Allowed to stand.

NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR, A. L. BARRY

1	Jeremiah Lantaigne.....	Fishing for trout through the ice.....	Baribogue River.....	\$1.00.
2	James Landry.....	Fishing for trout through the ice.....	Baribogue River.....	\$1.00.
3	Fred Goguen.....	Interfering with a fishery officer.....	Cocagne Cape.....	\$100.00 or 60 days in jail.
4	Theo. LeBlanc.....	Oyster Fishing in close season.....	Buctouche Bay.....	Not guilty.
5	Calixte LeBlanc.....	Oyster Fishing in close season.....	Buctouche Bay.....	Not guilty.
6	Amrose Myers.....	Having in possession oysters in close season.....	St. Thomas.....	\$100.00 and had confiscated from him 2 bushels of oysters.
7	Amos Bourque.....	Having in possession oysters in close season.....	Cocagne.....	\$100.00 and had confiscated from him 1 quart of shelled oysters.
8	Joseph Boudreau.....	Fishing for lobsters in close season.....	Green Point.....	Admonished.
9	William LeBlanc.....	Failing to liberate alive berried lobsters.....	Buctouche.....	\$100.00 or 30 days in jail and had confiscated from him 1 brush used for brushing berried lobsters.
10	Teddy Bourque.....	Failing to liberate alive berried lobsters.....	Buctouche Bay.....	\$100.00.
11	Donat Leger.....	Failing to liberate alive berried lobsters.....	Buctouche Bay.....	\$100.00 or 30 days in jail and had confiscated from him 1 brush used for brushing berried lobsters.
12	Jack Mooney.....	Failing to liberate alive berried lobsters.....	Buctouche Bay.....	\$100.00 and had confiscated from him 1 brush for brushing berried lobsters.
13	Clovie Myers.....	Failing to liberate alive berried lobsters.....	Buctouche Bay.....	\$100.00 and had confiscated from him 3 berried lobsters.
14	Fred Stothart.....	Failing to remove salmon net at close season.....	Ferryville, Mir. River.....	\$5.00.
15	John Taylor.....	Failing to have salmon net tagged.....	Napan Bay.....	\$1.00.
16	Wm. Morrison.....	Failing to properly tie up salmon net during weekly close season.....	Miramichi River.....	\$2.00.
17	George Bowie.....	Failing to properly tie up salmon net during weekly close season.....	The Willows, Miramichi River.....	\$2.00.
18	Jas. Scott.....	Failing to properly tie up salmon net during weekly close season.....	L. Newcastle, Miramichi R.....	\$2.00.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*
 NEW BRUNSWICK—DISTRICT No. 2—*Concluded*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
19	Harvey Morrison.....	Fishing for salmon in close season.....	Tabacintac River.....	\$50.00.
20	John B. Lagacey.....	Violating Section 29 of the Fisheries Act—Lobsters in close season.....	Green Point.....	\$50.00.
21	Norman Lagacey.....	Violating Section 29 of the Fisheries Act—Lobsters in close season.....	Green Point.....	\$10.00.
22	George Smith.....	Failing to have salmon net tagged.....	Lower Newcastle.....	\$1.00.
23	John Ginnish.....	Fishing for oysters in close season.....	Bay du Vin.....	\$1.00.
24	Wm. Donnell.....	Buying berried lobsters.....	Cocagne Cape.....	\$25.00.
25	Patrick Despres.....	Bringing ashore berried lobsters.....	Cocagne Cape.....	\$50.00.
26	Wm. Martin.....	Fishing for oysters in close season.....	Bay du Vin.....	\$1.00.
27	Harry Heilman.....	Drifting for salmon without a license.....	East Coast.....	Not guilty.
28	Dave Jenkins.....	Drifting for salmon without a license.....	East Coast.....	Not guilty.
29	Leslie Lewis.....	Drifting for salmon without a license.....	East Coast.....	Case withdrawn.
30	Wm. Mills.....	Drifting for salmon without a license.....	East Coast.....	Case withdrawn.
31	F. G. S. Richard.....	Failing to return to beds small oysters.....	East Coast.....	Case withdrawn.
32	Cyril Myers.....	Failing to return to beds small oysters.....	Buctouche.....	\$10.00.
33	Willie Jacob.....	Taking seed lobsters to shore.....	Buctouche.....	\$10.00.
34	Theodore Gould.....	Taking seed lobsters to shore.....	Little Cape.....	\$25.00.
35	Adelard Gould.....	Taking seed lobsters to shore.....	Cape Bald.....	\$25.00.
36	Philippe B. LeBlanc.....	Taking seed lobsters to shore.....	Cape Bald.....	\$25.00.
37	Wm. Martin.....	Failing to return to beds small oysters.....	Aboujagan.....	\$25.00.
38	A. Nicholson.....	Failing to return to beds small oysters.....	Miramichi Bay.....	\$5.00.
39	Leonidas Doiron.....	Failing to return to beds small oysters.....	Miramichi Bay.....	\$5.00.
40	John Lambert.....	Failing to return to beds small oysters.....	Miramichi Bay.....	\$5.00.
41	James Jimmo.....	Failing to return to beds small oysters.....	Miramichi River Oak Point.....	\$5.00.
42	John Surette.....	Failing to return to beds small oysters.....	Miramichi Bay.....	\$10.00.
43	Edward Surette.....	Failing to return to beds small oysters.....	Buctouche Bay.....	\$10.00.
44	Philias Cormier.....	Fishing one smelt grill-net without a license.....	Little River.....	\$10.00.
45	Frank Daigle.....	Fishing for smelts without a license in close season.....	Little Aldouane.....	\$2.00 and had confiscated from him 1 grill-net.
46	Alfred Murray.....	Having in possession without lawful excuse smelts in close season.....	Richibucto.....	\$20.00.
47	Mr. Bobby.....	Having lobsters in his possession illegally.....	Cape Tormentine.....	\$50.00.
48	William Reid.....	Fishing for lobsters out of season.....	Cape Tormentine.....	\$2.00.
49	Roy Allen.....	Fishing for lobsters out of season.....	Cape Tormentine.....	\$5.00.
50	Foster Allen.....	Fishing for lobsters out of season.....	Cape Tormentine.....	\$5.00.
51	Wm. Flaherty.....	Failing to return to public beds small oysters.....	Cape Tormentine.....	\$5.00.
52	Francis McDonald.....	Failing to return to public beds small oysters.....	Miramichi River.....	\$2.00.
53	Margerie Duplancey, Octave Duplancey, Henry Oullette, Vital Collette, Francis Collette, Alb. Collette.....	Having in possession oysters in close season.....	Miramichi Bay.....	\$10.00.
			Buctouche.....	Not guilty.
54	John Russell.....	Failing to return to public beds undersized oysters.....	Miramichi Bay.....	Not guilty.
55	Wright Gregan.....	Fishing for smelts in close season.....	Miramichi Bay.....	\$25.00 and costs \$13.00.
56	Allen Gregan.....	Fishing for smelts in close season.....	Miramichi Bay.....	\$25.00 and costs \$13.00.

NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR, H. E. HARRISON

1	Chester Plant.....	Water pollution.....	Little River, Victoria Co.....	\$20.00.
2	C. W. Lewis.....	Water pollution.....	St. John River, Victoria Co...	\$20.00.
3	Alex. McCarthy.....	Fishing for shad in weekly close time.....	St. John River, York Co.....	\$10.00.
4	Edward Payne.....	Fishing for shad in weekly close time.....	St. John River, York Co.....	\$10.00 and costs.
5	McTavish Duncan.....	Using small mesh dip-net for salmon.....	N.W. Miramichi River.....	\$10.00 and costs and had confiscated from him 1 small mesh dip-net.
6	Barney Baker.....	Fishing for salmon with spear and torch.....	St. John River.....	\$10.00 and had confiscated from him 1 boat, spear and torch.
7	Dan Beaumaster.....	Fishing for salmon with spear and torch.....	St. John River.....	\$10.00.
8	Samuel Thibodeau.....	Water pollution.....	Siegas River.....	\$20.00.
9	Gordon Robinson.....	Fishing salmon with wire net.....	South West Miramichi River.....	\$50.00 and had confiscated from him 1 wire net.
10	Peter Harris.....	Fishing salmon with wire net.....	South West Miramichi River.....	\$50.00. The article confiscated is the same article as in Pros. No. 9.
11	Edgar Robinson.....	Using net without permit.....	South West Miramichi River.....	\$50.00 and confiscated from him 1 wire net.
12	Donald A. McLean.....	Fishing for salmon with net in close season.....	St. John River.....	\$10.00 and had confiscated from him 1 salmon net.
13	James Whalen.....	Fishing with nets in closed season period.....	Renous River.....	\$50.00 and had confiscated from him 1 net and 1 board canoe—Suspended sentence.
14	Bernard Halahan.....	Fishing with nets in closed season period.....	Renous River.....	\$50.00 and had confiscated from him 1 net and 1 board canoe. Suspended sentence.
15	Harold Lyons.....	Fishing with net for salmon without license.....	Southwest, Miramichi River.....	\$50.00 or 2 months in jail and had confiscated from him 1 wire net. Suspended sentence.
16	Alfred Jardine.....	Fishing with net for salmon without license.....	Southwest, Miramichi River.....	\$50.00 or 2 months in jail. Had confiscated from him 1 canoe, 2 twine nets.
17	Alex. Dunphy.....	Fishing for salmon in closed season.....	St. John River.....	\$5.00 and had confiscated from him 1 salmon net.
18	John Burpee.....	Fishing for salmon in closed season.....	St. John River.....	\$5.00 and had confiscated from him 1 salmon net.
19	George Richard.....	Having salmon in possession contrary to law (Sec. 29, F.A.).....	Blackville.....	\$25.00 or 1 month in jail and had confiscated from him 1 salmon and salmon heads.
20	Freeman Stewart.....	Fishing for and having one salmon in possession.....	Southwest Miramichi River.....	\$50.00 or 2 months in jail. Suspended sentence and costs \$11.00 and had confiscated from him 1 salmon, 1 canoe and 1 twine net.
21	Wm. Stewart, Jr.....	Fishing for and having one salmon in possession.....	Southwest Miramichi River.....	\$50.00 or 2 months in jail and costs \$11.00. Suspended sentence. The confiscated articles are the same articles as in Pro. 20.
22	Mathew Connick.....	Fishing for salmon with net in closed season.....	Northwest Miramichi River.....	\$50.00 and costs or 2 months in jail. Suspended sentence. Had confiscated from him 1 twine net.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*
 NEW BRUNSWICK—DISTRICT No. 3—*Concluded*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
23	Garnet Arbeau.....	Fishing for salmon with net in closed season.....	Cains River.....	\$5.00 or 2 months in jail. Suspended sentence. Had confiscated from him 1 salmon net and costs \$2.00.
24	Rheben Goodine.....	Killing fish by use of explosives.....	Tobique River.....	\$100.00 and costs \$2.50. Suspended sentence.
25	Joseph Goodine.....	Killing fish by use of explosives.....	Tobique River.....	\$100.00 and costs \$2.50. Suspended sentence.
MANITOBA—SUPERVISOR, J. B. SKAPTASON				
1	D. A. Grose.....	Violation of Sec. 2, Sub. sec. D of the Fish. Act.....	Westbourne.....	\$5.00.
2	Albert Vernon Warrian.....	Violation of Sec. 35, Spec. Fish. Regs.....	Crooked Creek Lake Dauphin.....	\$5.00 and costs.
3	Robert McEwan.....	Violation of Sec. 36, Spec. Fish. Regs.....	Crooked Creek, Lake Dauphin.....	\$5.00 and costs and had confiscated from him 2 spears.
4	Henry Chas. Shusher.....	Using dip-net.....	Near Fishway, St. Andrews Lock.....	\$5.00 and had confiscated from him 1 dip-net.
5	Joe Minkus.....	Fishing without permit violating Sec. 2, sub-sec. 1, F. R.....	Gladstone.....	\$5.00.
6	J. Smith.....	Fishing with dip-net near fish way.....	St. Andres Lock, Red River.....	\$5.00 and had confiscated from him 1 dip-net.
7	E. Dittloff.....	Fishing with dip-net near fish way.....	St. Andres Lock, Red River.....	\$5.00 and had confiscated from him 1 dip-net.
8	J. Begrezz.....	Fishing with dip-net near fish way.....	St. Andres Lock, Red River.....	\$5.00.
9	Mrs. Matilda Strosden.....	Fishing by means other than by angling without a permit.....	Winnipeg River near Lac du Bonnet.....	Costs of court.
10	Mrs. Mina Kalnaen.....	Fishing by means other than by angling without a permit.....	Winnipeg River near Lac du Bonnet.....	Costs of court.
11	Hugh O'Grady.....	Fishing by means other than by angling without a permit.....	Winnipeg River near Lac du Bonnet.....	Costs of court.
12	John G. Anderson.....	Violation of Sec. 30, sub-sec. 1 of the Fish. Act.....	Lac du Bonnet.....	No fine imposed.
13	C. F. Carlson.....	Fishing by means other than by angling without a permit.....	Winnipeg River, Lac du Bonnet.....	Fined costs of court.
14	Hugh O'Grady.....	Using illegal mesh nets violating Sec. 8, sub-sec. 1, D. F. R.....	Near Lac du Bonnet.....	\$5.00 and had confiscated from him 1 gill-net.
15	Edward Raven.....	Fishing illegal mesh, viol. Sec. 4, sub. sec. 1 (a) F. R.....	Eagle Island, Lake Winnipeg.....	Had confiscated from him 2 gill-nets and reprimanded.
16	Sam Kent.....	Fishing illegal mesh, viol. Sec. 4, sub-sec. 1 (a) F. R.....	Eagle Island, Lake Winnipeg.....	Had confiscated from him 4 gill-nets and reprimanded.

17	Tom Lambert.....	Fishing illegal mesh, viol. Sec. 4, sub. sec. 1 (a) F.R.	Eagle Island, Lake Winnipeg.	Had confiscated from him 3 gill-nets and reprimanded.
18	Harry Williams.....	Fishing illegal mesh, viol. Sec. 4, sub. sec. 1 (a) R.F.	Eagle Island, Lake Winnipeg.	Had confiscated from him 4 gill-nets and reprimanded.
19	Ole J. Sigurdson.....	Fishing illegal mesh, viol. Sec. 4, sub. sec. 1 (a) F.R.	Vicinity of Snider Isl., Winni- peg Lake.	\$10.00 and had confiscated from him 7 gill-nets.
20	Doris Cucksey.....	Illegal fishing, viol. Sec. 14, sub. sec. e, Fish. Regs.	Seven Sister Area, Winnipeg River.	Costs of court \$9.50 and had confiscated from him 1 sturgeon and 1 sturgeon line.
21	Oli P. Isfeld.....	Fishing with illegal mesh nets ($3\frac{3}{4}$ " m.).....	Winnipeg Beach.....	\$10.00 or 10 days in jail and had confiscated from him 5 gill-nets.
22	Benedict Wm. Naas.....	Fishing with illegal mesh nets ($3\frac{3}{4}$ " m.).....	Vic. of Nes.....	\$10.00 or 15 days in jail and had confiscated from him 413 lbs. of fish (mixed).
23	John Bradbury.....	Fishing in close season viol. Sec. 7, subsec. 1, F.R. after limit had been taken.	Lake Winnipegosis, vic. Fox Point.	\$25.00 and had confiscated from him 871 lbs. mixed fish.
24	Isaac Bradbury.....	Fishing in close season viol. Sec. 7, Subsec. 1, F.R. after limit had been taken.	Lake Winnipegosis, vic. Fox Point.	\$25.00 and had confiscated from him 959 lbs. of fish.
25	Edward Flor.....	Illegal size mesh nets, viol. Sec. 4, subsec. 5, (a) F.R.	Near Rabbit Pt., Lake Winni- peg.	\$10.00 and had confiscated from him 2 gill-nets.
26	Levi Horney.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	\$5.00 and costs and had confiscated from him 1-22 calibre rifle.
27	John Reinhart.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	\$5.00 and costs \$1.00 and had confiscated from him 1-22 calibre rifle.
28	Clarence Honey.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	\$5.00 and costs \$1.00 and had confiscated from him 1-303 British Winchester Rifle and 1-22 calibre rifle.
29	Stanley Honey.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	\$2.50 and costs \$1.50 and had confiscated from him 1 pitch fork.
30	George Man.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	\$2.50 and costs \$1.50 and had confiscated from him 1 pitch fork.
31	Robert John Man.....	Fishing illegally contrary to Sec. 20, sub-sec. 2, F. Regs.	Silver Creek, N. of Biscarty, Man.	Case dismissed.
32	Morley Clegg.....	Assisting in illegal fishing cont. to Sec. 20, sub-sec. 2, F.R.	Silver Creek, N. of Biscarty, Man.	
33	W. D. Leslie.....	Fishing small mesh nets viol. sec. 11, F.R.	Lake Dauphin, vic. of Ochre River.	\$15.00 and had confiscated from him 50 lbs. of fish and 14 nets.
34	H. L. Adam.....	Fishing small mesh nets viol. sec. 11, F.R.	Lake Dauphin, vic. of Rorkton Man.	\$25.00 and had confiscated from him 11 nets and 453 lbs. fish.
35	G. Linton.....	Fishing small mesh nets viol. sec. 11, F.R.	Lake Dauphin, Turtle River...	\$15.00 and had confiscated from him 4 nets.
36	W. R. Ingster.....	Fishing small mesh nets viol. sec. 11, F.R.	Lake Dauphin, vic. of Rorkton	\$15.00 and had confiscated from him 4 nets.
37	Paul Johnson.....	Fishing illegal mesh nets.....	Burntwood Pt. Moore Lake...	\$25.00 and had confiscated from him 10 gill-nets.
38	Mike Tolpas.....	Fishing with $3\frac{3}{4}$ " mesh nets.....	Lake Dauphin, vic., of Fork River.	\$10.00 and had confiscated from him 2 nets.
39	Bill Marchuk.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.
40	Nick Lushaw.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.
41	Martin Kinnear.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—Continued

MANITOBA—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
42	Ralph Way.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.
43	John Boonk.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.
44	Bill Davidson.....	Fishing with illegal contrivance, viol. sec. 20 of the Fish. Regs.	Assinaboine River.....	Let off with warning.
SASKATCHEWAN—SUPERVISOR, G. C. McDONALD				
1	Otto Korchusky.....	Fishing with illegal apparatus cont. to Sec. 14. Sub-sec. 1.	Wolverine Creek.....	\$1.00.
2	Otto Korchusky.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Wolverine Creek.....	\$1.00.
3	Mart Hennery.....	Fishing with illegal apparatus contrary to Sec. 14, subsec. 1 of the Regs.	Wolverine Creek.....	\$1.00.
4	Mart Hennery.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Wolverine Creek.....	\$1.00.
5	Dan Krause.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1, of the Regs.	Wolverine Creek.....	\$1.00.
6	Dan Krause.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Wolverine Creek.....	\$1.00.
7	Ed. Sukert.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1, of the Regs.	Wolverine Creek.....	\$1.00.
8	Edward Sukert.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2, of the Sp. Fish. Regs.	Wolverine Creek.....	\$1.00.
9	Emil Dolke.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1, of the Spec. Fish. Regs.	Wolverine Creek.....	\$1.00.
10	Emil Dolke.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2, of the Regs.	Wolverine Creek.....	\$1.00.
11	Hy Wilus.....	Illegal apparatus contrary to Sec. 14, sub-sec. 1 of the F. Regs.	Wolverine Creek.....	\$1.00.
12	Hy Wilus.....	Fishing in closed season contrary to Sec. 12, sub-sec. B, of the Spec. F.R.	Wolverine Creek.....	\$1.00.
13	Cris Hove.....	Fishing with an illegal net contrary to Sec. 11, sub-sec. 1, of the Regs.	Rowan Ravine, Long Lake....	\$2.50 and had confiscated from him 1 gill-net.
14	Cris Hove.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Rowan Ravine, Long Lake....	\$2.50.

15	Dan Danielsen.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Rowan Ravine, Long Lake....	\$2.50.	
16	Dan Danielsen.....	Fishing with an illegal net contrary to Sec. 11, sub-sec. 1, of the Regs.	Rowan Ravine, Long Lake....	\$2.50.	
17	A. G. Dyer.....	Fishing with an illegal net contrary to Sec. 11, sub-sec. 1 of the Regs.	Rowan Ravine, Long Lake....	\$2.50 and had confiscated from him 1 net.	
18	A. G. Dyer.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Rowan Ravine, Long Lake....	\$2.50.	
19	T. E. Bennet.....	Fishing with an illegal mesh net contrary to Sec. 11, sub-sec. 1.	Rowan Ravine, Long Lake....	\$2.50.	
20	T. E. Bennet.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2, of the Regs.	Rowan Ravine, Long Lake....	\$2.50.	
21	R. Rodenbuch.....	Preparing to fish in close season contrary to Sec. 12, sub-sec. 2, of the Fish. Regs.	Rowan Ravine, Long Lake....	Admonished.	
22	R. Rodenbuch.....	Preparing to use an illegal mesh net contrary to Sec. 11, sub-sec. 1, of the Regs.	Rowan Ravine, Long Lake....	Admonished.	
23	J. Dutrich.....	Preparing to fish in close season contrary to Sec. 12, sub-sec. 2 of the Regs.	Rowan Ravine, Long Lake....	Admonished.	
24	J. Dutrich.....	Using an illegal mesh net contrary to Sec. 11, sub-sec. 1, of the Regs.	Rowan Ravine, Long Lake....	Admonished. Had him 1 gill-net.	from
25	C. Hopp.....	Fishing with illegal apparatus contrary to sec. 14, sub-sec. 3 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
26	C. Hopp.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
27	A. Hopp.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 3 of the Fish. Regs.	Wolverine Creek.....	\$2.50 and had confiscated from him 1 spear.	
28	A. Hopp.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
29	F. Hopp.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 3 of the Fish. Regs.	Wolverine Creek.....	\$2.50 and had confiscated from him 1 spear.	
30	F. Hopp.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Wolverine Creek.....	\$2.50.	
31	Cet Getbrner.....	Fishing in closed season contrary to sec. 12, sub-sec. 2 of the Regs.	Wolverine Creek.....	\$2.50.	
32	Cet Getbrner.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 3 of the Fish. Regs. at	Wolverine Creek.....	\$2.50 and had confiscated from him 1 spear.	
33	W. Getbrner.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 3 of the Fish. Regs. at	Wolverine Creek.....	\$2.50 and had confiscated from him 1 spear.	
34	W. Getbrner.....	Fishing in close season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
35	H. Getbrner.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 3 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
36	H. Getbrner.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Wolverine Creek.....	\$2.50.	
37	Karl Voehel.....	Using a net without a license sub-sec. 1 of Sec. 2, F.R.	Qu'Appelle River.....	\$5.00 and confiscated from him 1 dip-net.	
38	John Mundering.....	Using a net without license S.S. 1 of the Sec. 2, F.R.	Qu'Appelle River.....	\$5.00 and had confiscated from him 2 dip-nets.	
39	Nick Milos.....	Using a net without license sub-sec. 1 of the Sec. 2, F.R.	Qu'Appelle River.....	\$5.00 and had confiscated from him 1 dip-net.	
40	Earl Schrum.....	Using a net without license sub-sec. 1 of the Sec. 2, F.R.	Qu'Appelle River.....	\$5.00 and had confiscated from him 2 dip-nets.	

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*
SASKATCHEWAN—*Continued*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
41	Geo. Ring.....	Using a net without license sub-sec. 1 of the Sec. 2, F. R.	Qu'Appelle River.....	\$5.00 and had confiscated from him 3 dip-nets.
42	Frank Wolfe.....	Using a net without license sub-sec. 1 of the Sec. 2, F. G.	Qu'Appelle River.....	\$5.00 and had confiscated from him 2 dip-nets.
43	Karl Wolfe.....	Using net without a license sub-sec. 1 of Sec. 2, of Fish. Regs.	Qu'Appelle River.....	\$5.00 and had confiscated from him 2 dip-nets.
44	Wm. Siebert.....	Using net without a license sub-sec. 1 of Sec. 2, of Fish. Regs.	Qu'Appelle River.....	\$5.00 and had confiscated from him 2 dip-nets.
45	Thorval Berven.....	Fishing contrary to Sec. 14, Clause 3 of the Spec. Fish. Regs.	Sec. 36, Tp. 33, Rge. 12 W. of 2nd Mer.	\$1.00.
46	Thorval Berven.....	Fishing contrary to Sec. 14, Clause 13 of the Spec. Fish. Regs.	Sec. 36, Tp. 33, Rge. 12, W. of 2nd Mer.	of \$1.00 and had confiscated from him 1 spear.
47	Sven Bergman.....	Fishing contrary to Sec. 12, Clause 2 of the Spec. Fish. Regs.	Sec. 36, Tp. 33, Rge. 12, W. of 2nd Mer.	of \$1.00.
48	Sven Bergman.....	Fishing contrary to Sec. 14, Cl. 3 of the Spec. Fish. Regs.	Sec. 36, Tp. 33, Rge. 12, W. of 2nd Mer.	of \$1.00 and had confiscated from him 1 fish spear.
49	Knit Elander.....	Fishing contrary to Sec. 12, Clause 2 of the Spec. Fish. Regs.	Sec. 6, Tp. 34, Rge. 11, W. of 2nd Mer.	of \$1.00.
50	Knit Elander.....	Fishing contrary to Sec. 14, Clause 3 of the Spec. Fish. Regs.	Sec. 6, Tp. 34, Rge. 11, W. of 2nd Mer.	of \$1.00 and had confiscated from him 1 spear.
51	Henry Selbee.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00 and had confiscated from him 1 wire drag-net.
52	Henry Selbee.....	Fishing in closed season, contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00 and had confiscated from him 200 lbs. mullet.
53	Lester Selbee.....	Fishing in closed season, contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
54	Lester Selbee.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
55	Frank Wallace.....	Fishing in close season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
56	Frank Wallace.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
57	Paul Selbee.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
58	Paul Selbee.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Fish. Regs.	Little Arm River, Chamberlain.	\$5.00.
59	Wasel Poinoisnik.....	Fishing contrary to Sec. 14, Clause 3 of the Spec. Fish. Regs.	Sec. 32, Tp. 33, Rge. 11 W. of 2nd Mer.	of \$2.00 and had confiscated from him 1 spear.
60	Wasel Poinoisnik.....	Fishing contrary to Sec. 12, Clause 2 of the Spec. Fish. Regs.	Sec. 32, Tp. 33, Rge. 11 W. of 2nd Mer.	of \$2.00.

61	Harry Sovac.....	Fishing contrary to Sec. 14, Clause 3 of the Spec. Fish. Regs.	Sec. 32, Tp. 33, Rge. 11 W. of \$1.00 and had confiscated from him 1 spear.
62	Harry Sovac.....	Fishing contrary to Sec. 12, Clause 2 of the Spec. Fish. Regs.	Sec. 32, Tp. 33, Rge. 11 W. of \$1.00.
63	Max Hershman.....	Having fish in his possession in closed season contrary Sec. 29 of the Fish. Act.	\$10.00 and had confiscated from him 100 lbs. tullibee and 50 lbs. of pickerel.
64	Roderic E. Williams.....	Preparing to fish in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Dismissed.
65	Roderic E. Williams.....	Preparing to use illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Regs.	Dismissed.
66	Peidman Johnston.....	Preparing to use illegal apparatus contrary to Sec. 14, Sub-sec. 1 of the Regs.	Dismissed and had confiscated 1 dip-net.
67	Peidman Johnson.....	Preparing to fish in close season contrary to Sec. 12, Sub-sec. 2 of Fish Regs.	Dismissed.
68	Chas. Nabess.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1.	Dismissed.
69	Wm. Nabess.....	Fishing with illegal apparatus contrary, sec. 14, sub-sec. 1.	Qu'Appelle \$5.00 and had confiscated from him 1 wire dip-net.
70	Ben Finkelstein.....	Having fish in possession in closed season contrary to Sec. 29, of the Fish. Act.	Craven Dam, Qu'Appelle \$5.00 and had confiscated from him 1 wire dip-net.
71	Jas. Leroy Jones.....	Having in possession pike during close season contrary to Sec. 29.	\$10.00 and had confiscated from 150 lbs. mixed fish.
72	Albert Paquette.....	Having in possession pike during close season contrary to Sec. 29.	Little Red Deer Creek..... \$1.00 and had confiscated from him 10 pike.
73	Carl Olson.....	Having in possession pike during close season contrary to Sec. 29.	Little Red Deer Creek..... \$1.00 and had confiscated from him 10 pike.
74	Alfred Jesse.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2, of the Regs.	Little Red Deer Creek..... \$1.00 and had confiscated from him 10 pike.
75	Alfred Jesse.....	Fishing with illegal apparatus contrary to Sec. 14, sec-sub. 1 of the Regs.	Craven Dam, Qu'Appelle Suspended sentence.
76	Joe Butterfield.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Craven Dam, Qu'Appelle Suspended sentence.
77	Gordon Bell.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Valeport, Long Lake..... \$5.00 and had confiscated from him 1 short bamboo rod, 1 line and hook.
78	Albert Evers.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Valeport, Long Lake..... \$5.00 and had confiscated from him 1 short bamboo rod, 1 line and hook.
79	Albert Evers.....	Fishing with illegal apparatus contrary to Sec. 14, sub-sec. 1 of the Regs.	Craven Dam, Qu'Appelle \$7.50 and had confiscated from him 1 wire dip-net.
80	Joe Frank.....	Fishing in closed season contrary to Sec. 12, sub-sec. 2 of the Regs.	Craven Dam, Qu'Appelle \$5.00.
81	Joe Frank.....	Fishing with illegal apparatus contrary to Sec. 14, Sub-sec. 1 of the Regs.	Craven Dam, Qu'Appelle \$7.50 and had confiscated from him 1 wire dip-net.
82	Wm. Beven.....	Fishing during close season, Sub-sec. 2 of Sec. 12, of Fish. Regs.	Craven River, Estevan Dam..... \$2.00 and had confiscated from him 1 bamboo rod, line and hook.
83	George Gaggerter.....	Using net without a license, S.S. 1 of the Sec. 2.....	Craven River, Macoun..... \$1.00 and had confiscated from him 1 dip-net, 15 lbs. pike.
84	Louis Boyer.....	Fishing by means of net without a license, S.S. 1 of Sec. 2.	Souris River, Macoun..... \$1.00 and had confiscated from him 1 dip-net.
85	John Mathieson.....	Fishing during close season S.S. 2 of Sec. 12, Fish. Regs.	Souris River, Estevan Dam..... \$2.00.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*
 SASKATCHEWAN—*Concluded*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
86	William Glaspey.....	Fishing during close season S.S. 2 of Sec. 12, Fish. Regs.	Souris River, Northgate.....	\$5.00 and had confiscated from him 1 gill-net.
87	William Glaspey.....	Fishing without a license, sub-sec. 1, Sec. 2 of the Fish. Regs.	Souris River, Northgate.....	\$5.00.
88	Ralph Kramer.....	Having in possession fish, Sec. 29 Fish. Act.....	Souris River, Midale.....	\$3.00 and had confiscated from him 3 pike and 1 gill-net.
89	W. Bender.....	Fishing during close season, sub-sec. 2, Sec. 12, F.R.	Qu'Appelle River, Hyde Dam.	\$2.00 and had confiscated from him 1 dip-net.
90	W. Bender.....	Impeding fish going through fish way at Sec. 36, Fish. Act.	Qu'Appelle River, Hyde Dam.	\$2.00.
91	W. Bender.....	Fishing without license sub-sec. 1, Sec. 2, Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$3.00.
92	Louis Draiger.....	Fishing during close season Sub. sec. 2, Sec. 12, of Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$3.00.
93	Peter Ulmer.....	Fishing during close season Sub. sec. 2, Sec. 12 of Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$3.00.
94	Henry Stein.....	Fishing without license, S.S. 1, Sec. 2, Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$3.00 and had confiscated from him 1 dip-net.
95	Henry Stein.....	Fishing during close season, S.S. 2, Sec. 12 of the Fish. Regs.	Qu'Appelle River Hyde Dam.	\$2.00.
96	Gus Kunkel.....	Fishing without a license S.S. 1, Sec. 2, of the Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$3.00.
97	Gus Kunkel.....	Fishing during close season, S.S. 2, Sec. 12, Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$2.00 and confiscated from him 1 dip-net.
98	Gus Kunkel.....	Impeding fish to go through a fish way Sec. 36, Fish. Act.	Qu'Appelle River, Hyde Dam.	\$2.00.
99	Rene Oudot.....	Illegal apparatus, S.S. 1, Sec. 14 of the Fish. Regs.	Qu'Appelle River Katepwe Dam.	\$5.00.
100	Rene Oudot.....	Fishing without a license, S.S. 1, Sec. 2 of Fish. Regs.	Qu'Appelle River, Hyde Dam.	\$5.00 and had confiscated from him 1 dip-net.
101	Philip Fellner.....	Using snare S.S. 1, Sec. 14, Fish. Regs.....	Qu'Appelle River, Katepwe Dam.	\$5.00 and had confiscated from him 20 lbs. pike, 1 snare.
102	Philip Fellner.....	Fishing without a license sub. sec. 1, Sec. 2, Fish. Regs.	Qu'Appelle River, Katepwe Dam.	\$10.00.
103	David Johnson.....	Having in possession fish, Sec. 29, Fish. Act.....	Qu'Appelle River, Katepwe Dam.	\$5.00 and had confiscated from him 6 lbs. pike.
104	P. Peterson.....	Destruction of fish fry, contrary Sec. 39 of the Fish. Act.	Valeport, Long Lake.....	\$5.00 and had confiscated from him 8 specimen of dead perch fry.
105	C. D. Strayer.....	Fishing in a prohibited place viz. a fishway, contrary to Sec. 36 of the Act.	Craven Dam, Qu'Appelle.....	\$7.50 or 15 days in jail.
106	C. D. Strayer.....	Fishing with illegal apparatus contrary Sec. 14, Sub. sec. 1 of the Regs.	Craven Dam, Qu'Appelle.....	\$7.50 or 15 days in jail and had confiscated from him 1 wire dip-net.

107	John Leader.....	Using net of illegal mesh, sub-sec. 1 of Sec. 11, of Fish. Regs.	of Pasqua Lake.....	\$2.00 and costs and had confiscated from him 1 gill-net.
108	Mike Bouga.....	Fishing with gill-net contrary to Sec. 2, Sub-sec. 11 of the Spec. Fish. Regs.	Leach Lake, near Sec. 16, Tp. 24, Rge. 4, W. of 2nd. Mer.	\$10.00 and had confiscated from him 1 gill-net.
109	Edmond Chesney.....	Fishing with gill-net contrary to Sec. 2, Sub-sec. 11 of the Spec. Fish. Regs.	Leach Lake, near Sec. 16, Tp. 24, Rge. 4, W. of 2nd. Mer.	\$10.00 and had confiscated from him 1 gill-net.
110	Tom Hudi.....	Fishing with gill-net contrary to Sec. 2, Sub-sec. 11 of the Spec. Fish. Regs.	Leach Lake, near Sec. 16, Tp. 24, Rge. 4, W. of 2nd. Mer.	\$10.00 and had confiscated from him 1 gill-net.
111	Frank Zelesky.....	Fishing with gill-net contrary to Sec. 2, Sub-sec. 11 of the Spec. Fish. Regs.	Leach Lake, near Sec. 16, Tp. 24, Rge. 4, W. of 2nd. Mer.	\$10.00 and had confiscated from him 1 gill-net.
112	L. Muczk.....	Fishing with gill-net contrary to Sec. 2, Sub-sec. 11 of the Spec. Fish. Regs.	Leach Lake, near Sec. 16, Tp. 24, Rge. 4, W. of 2nd. Mer.	\$10.00 and had confiscated from him 1 gill-net.
113	Volmor Muller.....	Using illegal mesh net, sub. sec. 1, sec. 11 of the Fish. Regs.	Round Lake.....	Dismissed.
114	Volmor Muller.....	Fishing without a license or permit, sub. sec. 1, Sec. 2, Fish. Regs.	Round Lake.....	\$2.50.
115	A. Briere.....	Having in possession fish in closed season.....	Jackfish Lake.....	\$2.50 and had confiscated from him 14 lbs. of fish.
116	E. Sookeroff.....	Fishing without a license.....	Barrier Lake, near Armstrong Pt.	\$25.00 and confiscated from him 307 lbs. of whitefish.
117	Wasil Chendkoff.....	Netting without license.....	Barrier Lake, near Armstrong Pt.	\$1.00 and costs \$1.75 and had confiscated from him 1 gill-net.
118	John Negroff.....	Netting without license.....	Barrier Lake, near Armstrong Pt.	\$1.00 and costs \$1.75.
119	Peter Sermuks.....	Fishing with nets during close season contrary Sec. 12, Fish. Regs.	Peck Lake.....	\$20.00 or two weeks in jail and had confiscated from him 3 gill-nets.
120	Peter Sermuks.....	Having in his possession whitefish during close season contrary Sec. 29, of the Fish Act.	Peck Lake.....	\$20.00 or two weeks in jail, and had confiscated from him 300 lbs. fish.
121	John Swannick.....	Fishing in closed season contrary Sec. 12, Sub. sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail and had confiscated from him 6500 lbs. whitefish and 1500 lbs. of pike and 4 gill-nets.
122	John Swannish.....	Fishing without a license contrary to Sec. 2, Sub-sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail.
123	John Fortin.....	Fishing in close season contrary to Sec. 12, Sub-sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail.
124	John Fortin.....	Fishing without a license contrary to Sec. 2, Sub-sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail.
125	Hoe Hoem.....	Fishing in close season contrary to Sec. 12, Sub-sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail.
126	Hoe Hoem.....	Fishing without a license contrary to Sec. 2, Sub-sec. 1 of the Regs.	Peter Pond Lake.....	\$15.00 or one month in jail.
127	Eric Vidal.....	Using spear in killing fish, Sec. 3 Fish. Regs.	Katapwe Lake.....	\$4.00 and costs \$1.75 and had confiscated from him 60 lbs. pike.
128	Geo. Morton Stewart.....	Fishing during close season contrary to Sec. 12 (1A) Regs.	Beaver River.....	\$20.00 and costs \$4.50 and had confiscated from him 51 whitefish.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*

ALBERTA—SUPERVISOR, R. T. RODD

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	G. S. Funderburg	Fishing with a small mesh net.	Lac La Biche	Not guilty. Had confiscated from him 1 gill-net.
2	Samuel Beck	Angling for jackfish in the close season	Lake Newell	\$5.00 and had confiscated from him 1 fishing rod.
3	A. Montgomery	Violation of Sec. 76 of the Fish Act.	Muir Lake	\$10.00.
4	L. E. Holland	Angling for jackfish in the close season.	Chestermere Lake near Calgary.	\$5.00.
5	M. Zimmerman	Violation of Sec. 12, Para. 2 of the Spec. Fish. Regs.	near Magnatic	\$2.00 and had confiscated from him 1 spear.
6	Cecil Sharran	Violation of Sec. 76 Fish Act.	Chip Lake	\$10.00.
7	A. E. Cross	Angling in close season contrary to Sec. 12, Para. 2 of the Spec. Fish. Act.	Chin Lakes	\$1.00 and had confiscated from him rod, reel, line and spinner.
8	J. Chalmers	Killing jackfish by means of a snare in the close season.	Highwood River, near High River.	\$1.00.
9	J. Teller	Killing jackfish by means of a snare in the close season.	Highwood River, Near High River.	\$1.00.
10	Lawrence Gilmore	Fishing without license and fishing in close season	Dog Pond River	\$5.00 and had confiscated from him 1 net.
11	Willis Ambrose	Having trout in possession, contrary to Sec. 29, Fish. Act.	Pineher Creek	\$10.00 and had confiscated from him 3 steelhead, 2 cut-throat trout.
12	Wong Chong	Infraction of Sec. 11, Para. 3, Using net with small mesh.	Oldman River near Leth-bridge.	\$10.00 and had confiscated from him 1 net and 40 suckers.
13	Wong Chong	Infraction of Sec. 1, Para. E. Having grayline in close season.	Oldman River, near Leth-bridge.	\$2.00 and had confiscated from him 4 grayline.
14	Wong Chong	Infraction of Sec. 1 Para. 2. Having grayline under-size.	Oldman River, near Leth-bridge.	\$2.00 and had confiscated from him 4 grayline.
15	Man Foon	Infraction of Sec. 1 Para. B. Having no permit to use net.	Oldman River, near Leth-bridge.	\$5.00.
16	Jim Wing	Infraction of Sec. 1, Para. B. Having no permit to use net.	Oldman River, near Leth-bridge.	\$5.00.
17	Roy Wing	Infraction of Sec. 1, Para. B. Having no permit to use net.	Oldman River, near Leth-bridge.	\$5.00.
18	Hoie Wing	Infraction of Sec. 1, Para. B. Having no permit to use net.	Oldman River, near Leth-bridge.	\$5.00.
19	William Brown	Having trout under 9" contrary to Sec. 1, Subsec. 2, Fish. Act.	Allison Creek, near Coleman.	\$5.00 and had confiscated from him 2 trout.
20	William Brown	Having trout in possession contrary to Sec. 1, Para. E, Fish. Act.	Allison Creek, near Coleman.	\$10.00 and had confiscated from him 1 willow stick gut line and hook.
21	Arthur Livingstone	Obstructing a fishery guardian in the execution of his duties.	Bragg Creek	\$50.00.
22	D. F. McFadyen	Pollution of the Bow River by manure from cattle corals.	Bonnybrook, Calgary	Suspended sentence.

23	J. L. Butler.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
24	E. Wade.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
25	W. P. Fleming.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
26	J. Champagne.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
27	T. Parson.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
28	B. Sewell.....	Pollution of the Bow River by manure from cattle corrals.....	Bonnybrook, Calgary.....	Suspended sentence.
29	V. Roberts.....	Angling without permit contrary to Sec. 1, Para. B., Fish. Act.....	South Fork, Old man River.....	\$1.00 and had confiscated from him rod, line and reel, 1 rainbow trout.
30	T. H. Roper.....	Angling without permit contrary to Sec. 1, Para. 2, Fish Act.....	Drywood Creek, near Twin Butte.....	\$5.00 and had confiscated from him 1 stick, line and hook.
31	C. Carlson.....	Pollution of a stream by allowing sawdust to enter it.....	Tributary of Dogpond Creek, near Bottrel.....	\$20.00.
32	A. Kinzie.....	Angling without permit contrary to Sec. 1, Para. B., Spec. Fish. Act.....	Drywood Creek.....	\$5.00 and had confiscated from him 1 pole string and hook.
33	W. L. Grinley.....	Angling without permit contrary to Sec. 1, Para. B., Spec. Fish. Act.....	Drywood Creek.....	\$5.00 and had confiscated from him 1 pole string and hook.
34	Leonard Snyder.....	Using dynamite to kill fish.....	Fallen Timber Creek.....	\$20.00.
35	Wilfrid Snyder.....	Using dynamite to kill fish.....	Fallen Timber Creek.....	Not guilty.
36	Harry Coates.....	Using dynamite to kill fish.....	Fallen Timber Creek.....	Not guilty.
37	William Coates.....	Using dynamite to kill fish.....	Fallen Timber Creek.....	Not guilty.
38	Harry Fries.....	Fishing with illegal nets.....	Wappaw Pt., Lesser Slave Lake.....	\$20.00 and had confiscated from him few fish and 5 gill-nets.
39	Gerald McDonald.....	Fishing in close season.....	South Valley Creek, Tributary of Elbow River.....	\$10.00.
40	R. Carl.....	Fishing in close season.....	Assineau Point, Lesser Slave Lake.....	\$20.00 and had confiscated from him 7 gill-nets.
41	J. Brager.....	Fishing in close season.....	Assineau Point, Lesser Slave Lake.....	\$20.00 and confiscated from him 18 gill-nets.
42	J. Brager.....	Fishing with illegal gill-nets.....	Assineau Point, Lesser Slave Lake.....	\$20.00. The nets confiscated are the same nets as in Pros. No. 41.
43	O. Lee.....	Fishing with illegal gill-nets.....	Assineau Point, Lesser Slave Lake.....	\$35.00 and had confiscated from him few fish and 4 gill-nets.
44	M. Peterson.....	Fishing with illegal nets.....	Narrows in Lesser Slave Lake.....	\$35.00 and confiscated from him 3 gill-nets.
45	Robert Sinton.....	Angling in close water, contrary to Sec. 14, Para. 8.....	Narrows in Lesser Slave Lake.....	\$1.00 and had confiscated from him rod, reel, line and 1 trout.
46	Alic Hulack.....	Fishing with illegal gill-nets.....	Pine Creek.....	\$35.00 and had confiscated from him 60 lbs. whitefish, 49 lbs. jackfish and 6 gill-nets.
47	Norman Tilley.....	Having nets in Lesser Slave Lake without the license number on them.....	Swan River Pt., in Lesser Slave Lake.....	\$20.00 and confiscated from him 5 gill-nets.
48	Norman Tilley.....	Fishing with illegal gill-nets.....	Wagner.....	\$20.00. The confiscated nets are the same nets as in Pros. No. 47.
49	C. Hayes.....	Not having license number on buoys.....	Wagner.....	\$20.00 and confiscated from him 4 gill-nets.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Continued*
ALBERTA—*Concluded*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
50	C. Hayes.....	Fishing with illegal gill-nets.....	Lesser Slave Lake.....	\$20.00. The confiscated nets are the same nets as in Pros. 49.
51	W. Mitchell.....	Killing fish under the legal size.	Elbow River.....	\$5.00.
52	Herman Harp.....	Having in possession fish in close season.....	Lake La Biche.....	\$50.00 and costs \$4.57 and had confiscated from him 250 tullibee.
53	Baptiste Pappin.....	Hanging fish contrary to Sec. 2, Para. 3 of the Fish. Regs.	Near Big Island, Lake La Biche.	\$10.00 and costs \$5.50 and confiscated from him 700 hung tullibee and 80 hung whitefish.
54	Walter Anderson.....	Fishing in close season.....	Big White fish Lake.....	\$20.00.
55	Wm. Muraveff.....	Fishing in close season.....	Wolf Lake.....	\$25.00 and had confiscated from him 580 lbs. fish and 8 gill-nets.
56	Bill Pojalin.....	Fishing in close season.....	Wolf Lake.....	\$25.00.
57	A. Johnson.....	Fishing outside the restricted areas.....	Lesser Slave Lake, near Wah-pow Point.	\$20.00 and had confiscated from him 1 gill-net.
58	A. Johnson.....	Fishing with an illegal gill-net.....	Lesser Slave Lake, near Wah-pow Point.	\$20.00 and the confiscated net is the same net as in Pros. 57.
59	Jack Murray.....	Fishing outside the restricted areas.....	Lesser Slave Lake, near Wah-pow Point.	\$20.00 and the confiscated net is the same net as in Pros. 57.
60	Jack Murray.....	Fishing with illegal gill-net, 5¼" mesh.....	Lesser Slave Lake, near Wah-pow Point.	\$20.00 and the confiscated net is the same net as in Pros. 57.
61	Walter Chelinsky.....	Fishing with snare and for fishing with net in closed waters.	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd. charge and costs \$3.00 and had confiscated from him 1 wire snare and 1 gill-net.
62	Ed. Scharte.....	Fishing with wire snare and for fishing in closed water with gill-net.	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd charge and had confiscated from him 1 wire snare and 1 gill-net.
63	Henry Nagle.....	Fishing with wire snare and for fishing in closed water with gill-net.	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd. charge and had confiscated from him 1 gill-net.
64	Wm. Nagel.....	Fishing with wire snare and for fishing in closed water with gill-net.	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd charge and had confiscated from him 1 wire snare and 1 gill-net.
65	Carl Nagel.....	Fishing with wire snare and for fishing in closed water with gill-net.	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd wire snare and 1 gill-net.
66	Collin Pringle.....	Fishing with snare.....	Gull Lake.....	\$1.00 on first charge and \$5.00 on 2nd wire snare and 1 gill-net.
67	Gilbert Stenerson.....	Fishing with nets of illegal mesh.....	Buffalo Lake.....	\$1.00 and costs \$1.00 and had confiscated from him 1 wire snare.
68	Oley Stenerson.....	Fishing with nets of illegal mesh.....	Buffalo Lake.....	Had confiscated from him 2 nets of illegal mesh.

69	Bruce Hunter.....	Having no license number on stakes.....	Lesser Slave Lake.....	\$10.00.
70	E. Englebreton.....	Having net outside the restricted area.....	Near Nine Mile Point., on Lesser Slave Lake.	\$5.00 and had confiscated from him 1 gill-net.
71	John Grinstead.....	Fishing in prohibited area contrary to Sec. 9A.....	Cold Lake.....	\$50.00 and had confiscated from him 2 nets and 60 lbs. of fish.
72	The Ideal Coal Co.....	Polluting a stream with mine refuse.....	Rosebud Creek, Wayne	\$40.00 and costs \$5.75.
73	Adam McDonald.....	Violation of Sec. 2, Para. 1 of the Spec. Fish Regs.	Lake Island.....	\$10.00. Allowed to stand.
74	W. Bellomy.....	Fishing without a license contrary to Para 1, Sec. 2	Hilda Lake.....	Suspended sentence. Had confiscated from him 4 gill-nets.
75	Stanley Fox.....	Fishing with gill-net without a license.....	Moose Lake.....	Suspended sentence with costs and had confiscated from him 1 gill-net.
76	Max Loch.....	Fishing commercially without a license.....	Moose Lake.....	\$25.00 and costs and had confiscated from him 2 gill-nets and 200 lbs. of pike.
77	Mike Berezen.....	Fishing commercially without a license.....	Moose Lake.....	\$25.00 and costs \$3.00 and had confis- cated from him 1 gill-net, 300 yards of line.

BRITISH COLUMBIA—CHIEF SUPERVISOR, MAJOR J. A. MOTHERWELL

DISTRICT No. 1—SUPERVISOR, A. P. HALLDAY

1	C. E. McCutcheon.....	Exceeding catch limit for trout.....	Fish Lake.....	Fined \$8.00 and 40 trout confiscated.
1A	Martin Louis.....	Selling undersized clams.....	Vancouver.....	Fined \$10.00.
2	Percy Rand.....	Exceeding catch limit for trout.....	Fish Lake.....	Fined \$3.00 and 40 trout confiscated.
2A	Vancouver Shellfish Co.	Selling undersized clams.....	Vancouver.....	Fined \$25.00.
3	K. Fujihara.....	Catching and retaining undersized crabs.....	White Rock.....	Fined \$10.00 and 30 small crabs confis- cated.
3A	H. M. Fraser.....	Selling undersized clams.....	Vancouver.....	Case dismissed.
4	H. S. Jerow.....	Lines of crab traps not properly marked.....	Crescent.....	Fined \$5.00.
4A	Georges Grevas.....	Buying undersized clams.....	Vancouver.....	Fined \$10.00.
5	Alex. Daye.....	Violation Sec. 2, Cl. 3 and Sec. 26, Clause 6, Fish- ery regulations.....	McBains Creek.....	Fined \$10.00 and 26 small trout confis- cated.
5A	Georges Grevas.....	Buying undersized clams.....	Vancouver.....	Fined \$5.00.
6	Mrs. Wo Long.....	In possession sturgeon under 3 feet in length.....	Port Hammond.....	Fined \$5.00 and 3 small sturgeon confis- cated.
6A	Man Wo Chung.....	Buying undersized crabs.....	Vancouver.....	Fined \$10.00.
7	R. A. Lye.....	Shooting fish with rifle.....	Fish Lake.....	Fined \$10.00 and .22 calibre rifle confis- cated.
7A	Man Wo Chung.....	Retaining undersized clams.....	Vancouver.....	Fined \$10.00.
8	J. McWhinnie.....	Jigging trout.....	Penticton Creek.....	Fined \$5.00 and gaff confiscated.
8A	John Alcano.....	Catching undersized crabs.....	Vancouver.....	Case dismissed.
9	K. Nishiyama.....	In possession undersized sturgeon.....	Coquitlam.....	Fined \$10.00 and 88½ lbs. sturgeon confis- cated.
9A	John Alcano.....	Selling undersized crabs.....	Vancouver.....	Fined \$10.00 and 7½ doz. crabs confis- cated.
10	Neill Tatttrie.....	In possession undersized trout.....	Bear Lake.....	Fined \$10.00 and 25 small trout confis- cated.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—Continued

BRITISH COLUMBIA—DISTRICT No. 1—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
10 A	Charles Kaneles.....	Buying undersized clams.....	Vancouver.....	Fined \$10.00.
11	M. Monk and Co.....	Exposing for sale undersized clams.....	New Westminster.....	Fined \$5.00 and 14 lbs. clams confiscated.
11 A	Charles Kaneles.....	Retaining undersized clams.....	Vancouver.....	Fined \$10.00.
12	M. Monk and Co.....	Retaining undersized clams.....	New Westminster.....	Case dismissed.
12 A	Hudsons Bay Co., Ltd.....	Buying undersized crabs.....	Vancouver.....	Fined \$25.00.
13	Jas. Carr.....	Exposing for sale undersized crabs.....	New Westminster.....	Fined \$5.00 and 6 small crabs confiscated.
13 A	Man Wo Chung.....	Buying undersized clams.....	Vancouver.....	Fined \$5.00.
14	Jas. Carr.....	Retaining undersized clams.....	New Westminster.....	Fined \$2.50 and 14 lbs. clams confiscated.
14 A	Tom Fraser.....	Using salmon eggs for bait.....	Seymour River.....	Fined \$7.50.
15	H. S. Jerow.....	Selling undersized crabs.....	Crescent.....	Case dismissed.
16	Geo. Wilson.....	In possession undersized sturgeon.....	New Westminster.....	Fined \$1.00 and 9 small sturgeon confiscated.
17	J. Teramura.....	In possession undersized sturgeon.....	New Westminster.....	Fined \$2.50.
18	L. Summartino.....	In possession undersized trout.....	N. fork Salmon River.....	Fined \$2.50 and 5½ lbs. trout confiscated.
19	V. Summartino.....	In possession undersized trout.....	N. fork Salmon River.....	Fined \$2.50.
20	W. Green.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
21	A. McLeod.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
22	L. Mitchell.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
23	H. Brooks.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
24	B. Donnelly.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
25	A. Hopkins.....	Spearing salmon.....	Salmon River.....	Fined \$2.00 9 fish spears and 4 salmon confiscated.
26	B. Iverson.....	Taking undersized trout.....	One Mile Creek.....	Fined \$5.00 and fishing pole confiscated.
27	Owen Kelley.....	Taking undersized trout.....	Mathew Creek.....	Fined \$5.00 and small trout confiscated.
28	W. Allerton.....	Violation Sec. 26, s.s. 6, Regulations.....	Le Levre Lake.....	Fined \$5.00 and 2 small trout confiscated.
29	W. Allerton.....	Violation Sec. 51, Chap. 73, Act.....	Le Levre Lake.....	Case dismissed.
30	F. R. Anderson.....	Violation Sec. 26, s.s. 6, Regulations.....	Le Levre Lake.....	Case dismissed.
31	Emil Louie.....	Violation Sec. 26, s.s. 6, Regulations.....	Bear and Denver Creeks.....	Fined \$5.00, line, hooks and small trout confiscated.
32	Nels Rymal.....	Violation Sec. 26, s.s. 2, Regulations.....	Fish Lakes.....	Fined \$3.00 and line, spoons and small trout confiscated.
33	J. Tanthori.....	Violation Sec. 24, Cl. 6, Regulations.....	Fraser River.....	Fined \$15.00.
34	Chas. Inkman.....	Buying fish from Indians.....	Agassiz.....	Fined \$50.00 and 30 lbs. sockeye and coho salmon confiscated.

35	Chas. Inkman.....	Having salmon in possession contrary to Sec. 29 of Fisheries Act.	Agassiz.....	Fined \$15.00.
36	George Douglas.....	Selling salmon caught under Indian Permit contrary to regulations.	Agassiz.....	Found guilty. No fine imposed. Warned and instructed to return to reservation.
37	J. Tytrens.....	Having salmon in possession contrary to Sec. 15 of Regulations.	Agassiz.....	Fined \$15.00 and 25 lbs. sockeye and coho salmon confiscated.
38	M. Tytrens.....	Having salmon in possession contrary to Sec. 15 of Regulations.	Agassiz.....	Fined \$15.00.
39	S. J. Ketchell.....	In possession undersized trout.....	Darks Creek.....	Fined \$10.00 and small trout and willow rod confiscated.
40	G. H. Daley.....	Spearing salmon.....	Louis Creek.....	Fined \$10.00, salmon and spear confiscated.
41	Ngai Choy.....	Buying salmon from an Indian.....	Mission.....	Fined \$5.00 and portion salmon confiscated.
42	Charley Seymour.....	Selling salmon caught under permit contrary to regulations.	Mission.....	Found guilty. Allowed to return to reserve with warning.
43	Jacob Bitterman.....	Gaffing kokanee.....	Woods Lake.....	Fined \$10.00, gaff and 12 kokanee confiscated.
44	James Joseph.....	Selling salmon caught under permit contrary to Regulations.	Matsqui.....	Fined \$10.00 and 2 salmon confiscated.
45	Roderick Dolan.....	Obstructing stream to passage of fish.....	Campbell River.....	Fined \$15.00 and set net, 75 ft. long, confiscated.
46	J. Fidell.....	Fishing within 200 yds of mouth of creek.....	Whonock River.....	Fined \$10.00 and 2 set nets confiscated.
47	Richard Patterson Sr.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$5.00.
48	Richard Patterson Jr.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$3.50.
49	Wm. Paulin.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$3.50.
50	R. Patterson.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$3.50.
51	John Brodwick.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$3.50.
52	A. Bakke.....	Fishing during weekly closed season.....	Fraser River.....	Fined \$3.50.

DISTRICT No. 2—SUPERVISOR, A. MACKIE

1	R. Edison.....	Having crabs in possession during prohibited period.	Prince Rupert.....	Fined \$1.00 and 9½ doz. crabs confiscated.
2	Minatchan.....	Acting as assistant on salmon gill-net boat without carrying license with him.	Chatham Sound.....	Fined \$25.00.
3	Moiche Kawamoto.....	Fishing with 5¼ mesh net during closed season.....	Chatham Sound.....	Fined \$150.00.
4	E. Humakko.....	Fishing for salmon and not carrying license on boat.	Chatham Sound.....	Fined \$25.00.
5	Sam Johnson.....	Fishing for salmon without a license.	Chatham Sound.....	Fined \$25.00.
6	Dan West.....	Fishing with set net.	Lebouchere Channel.....	Fined \$25.00.
7	Ogami.....	Fishing for salmon without a license.	Eestahl River.....	Fined \$25.00, net, boat and gear confiscated.
8	J. B. Iversen.....	Fishing for salmon with two nets.....	Chatham Sound.....	Fined \$10.00.
9	William Gramert.....	Fishing for salmon without a license.....	Chatham Sound.....	Fined \$25.00 and 11 salmon confiscated.
10	Tsunetaro Murakami.....	Fishing during weekly closed time.....	Skeena River.....	Fined \$50.00.
11	Dwyer Green.....	Using anchored salmon net.....	Chatham Sound.....	Fined \$25.00.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—Continued

BRITISH COLUMBIA—DISTRICT No. 2—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
12	Hiko Fujihada.....	Fishing for salmon with set net.....	Chatham Sound.....	Fined \$25.00.
13	Robert Andy.....	Fishing within fishery boundary.....	N. Bentinck Arm.....	Fined \$35.00.
14	Fred Stewart.....	Making "open set" with seine.....	Canoë Pass.....	Fined \$150.00.
15	Isaac Benson.....	Fishing for salmon with anchored net.....	Skeena River.....	Fined \$25.00.
16	Nat Lewis.....	Carrying purse-seine less than 250 meshes.....	Steamer Pass.....	Fined \$100.00.
17	I. Miyawake.....	Fishing with net within $\frac{1}{2}$ mile of mouth of creek.....	Portland Inlet.....	Fined \$100.00, salmon net and 229 salmon confiscated.
18	T. Hamaguchi.....	Fishing with net within $\frac{1}{2}$ mile of mouth of creek.....	Portland Inlet.....	Fined \$100.00, salmon net and 229 salmon confiscated.
19	Henry McKay.....	Fishing for salmon during closed season.....	Mathieson Channel.....	Fined \$200.00.
20	Jacob White.....	Fishing with seine within $\frac{1}{2}$ mile of mouth of creek.....	Mathieson Channel.....	Fined \$100.00.
21	John Katnic.....	Anchoring purse-seine to shore.....	Ellerslie Channel.....	Fined \$100.00.
22	John Phillips.....	Operating gill-net within fishery boundary.....	N. Bentinck Arm.....	Fined \$100.00.
23	Henry Green.....	Fishing with seine within $\frac{1}{2}$ mile of mouth of creek.....	Stacks Creek, Skidegate Inlet.....	Fined \$150.00.
24	K. B. Johnson.....	Commencing to fish before area opened.....	Juskatla Inlet.....	Fined \$50.00.
25	N. Gunderson.....	Fishing with seine inside boundary.....	Yakoun River.....	Fined \$150.00.
26	Olav Knutson.....	Fishing with seine inside boundary.....	Yakoun River.....	Fined \$150.00.
27	James Martin.....	Fishing with seine inside boundary.....	Yakoun River.....	Case dismissed.
28	Alfred Skadeen.....	Fishing for salmon during weekly closed season.....	Naas River.....	Fined \$25.00.
29	Joe McKay.....	Bringing fresh salmon from above tidal boundary.....	Stream in Chatham Sound.....	Case dismissed.
30	Robert Watson.....	Bringing fresh salmon from above tidal boundary.....	Stream in Chatham Sound.....	Case dismissed.
31	S. Kristensen.....	Operating purse-seine less than 150 fathoms in length.....	District No. 2.....	Fined \$100.00.
32	Klaus Ostrom.....	Fishing for salmon within $\frac{1}{2}$ mile of mouth of stream.....	District No. 2.....	Fined \$300.00, 1124 salmon confiscated.
33	R. Grant.....	Fishing inside fishery boundary.....	N. Bentinck Arm.....	Fined \$50.00.
34	Thomas Marks.....	Fishing for salmon within $\frac{1}{2}$ mile of mouth of stream.....	Saltspring Bay.....	Fined \$50.00.
35	Tom Colbourne.....	Fishing inside fishery boundary.....	Cumshewa Inlet.....	Fined \$200.00.
36	Wm. Oram.....	Bringing fresh salmon from above tidal boundary.....	Carter Bay, Q.C.I.....	Fined \$50.00, 97 salmon confiscated.
37	Harold Liene.....	Fishing during weekly closed season.....	Larscombe Bay, Q.C.I.....	Fined \$70.00.
38	P. Adams.....	Bringing fresh salmon from above tidal boundary.....	Naas River.....	Fined \$150.00, boat, gear and 370 salmon confiscated.
39	Ole Skog.....	Carrying 2 additional pieces net on boat.....	South Bay, Q.C.I.....	Fined \$125.00.
40	Ole Skog.....	Refusing to show license when requested.....	South Bay, Q.C.I.....	Fined \$100.00.
41	Ole Skog.....	Obstructing a fishery officer in the execution of his duties.....	South Bay, Q.C.I.....	Case dismissed.
42	Edward Smith.....	Operating gill-net fastened at one end.....	Kildala Bay.....	Fined \$20.00.
43	Y. Taketa.....	Fishing with net inside fishery boundary.....	Hole-in-the-Wall, Creek.....	Fined \$200.00.
44	George Price.....	Fishing for salmon in prohibited area.....	Dena River.....	Fined \$50.00, 123 salmon confiscated.

DISTRICT No. 3—SUPERVISOR, E. G. TAYLOR

1	Jin Asahina.....	Contravention Sec. 15, s.s. 1a, Sec. 14, s.s. 2, and Sec. 21, s.s. 25, Regulations.	Deserted Bay.....	Fined \$100.00, skiff and herring net confiscated.
2	Jack Simpson.....	Contravention, Sec. 6, s.s. 2, Regulations.	Victoria.....	Fined \$10.00, 100 lbs. cod confiscated.
3	Philip Pelky.....	Contravention Sec. 7, Regulations.	Victoria.....	Fined \$10.00, 7 doz. crabs and 100 lbs. cod confiscated.
4	Paul Avery.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
5	Fred Gillett.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
6	Chief Atileo.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
7	Matthew Paul.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
8	Herbert Campbell.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
9	Alfred Keitlah.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
10	Thomson Patty.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
11	David Frank.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
12	Luke Swan.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
13	George Shamrock.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
14	Chief Benson.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
15	Jumbo George.....	Contravention Sec. 18 Fisheries Act.	Medgin River.....	Fined \$25.00.
16	Watty Sewish.....	Contravention Sec. 21, s.s. 18, para. (b) Regulations.	Uchucklesit Harbour.....	Fined \$10.00, 7 sockeye confiscated.
17	Andrew Larsen.....	Contravention Sec. 21, s.s. 18, para. (b) Regulations.	Uchucklesit Harbour.....	Fined \$10.00, 34 sockeye confiscated.
18	Itchiaro Uyede.....	Contravention Sec. 15, s.s. 1a, Regulations.	Pachena Bay.....	Fined \$75.00, 21 coho, 39 lbs. red spring salmon confiscated.
19	Kimjuro Nishino.....	Contravention Sec. 24, s.s. 7a, Regulations.	Deep Bay.....	Fined \$100.00, boat and gear confiscated. Later returned to owner.
20	Louis Smith.....	Contravention Sec. 21, s.s. 18, Regulations.	Mahata River.....	Case dismissed.
21	Johnny Page.....	Contravention Sec. 51, Fisheries Act.	Cowichan River.....	Fined \$100.00.
22	Johnny Page.....	Contravention Sec. 21, s.s. 12b, Regulations.	Cowichan River.....	Fined \$5.00.
23	Harry H. Smith.....	Contravention Sec. 21, s.s. 18b, Regulations.	Uchucklesit Harbour.....	Fined \$10.00.
24	Maynard Dubois.....	Contravention Sec. 21, s.s. 2, Regulations.	Agamemnon Channel.....	Fined \$15.00.
25	H. Wilson.....	Contravention Sec. 29, s.s. 1, Regulations.	Kingcome Inlet.....	Fined \$10.00.
26	Usabury Otsuka.....	Contravention Sec. 15, s.s. 1a, Regulations.	Bute Inlet.....	Fined \$25.00.
27	V. Ferrario.....	Contravention Sec. 29, s.s. 1, Regulations.	Robson Bight.....	Case dismissed.
28	Alexander Nelson.....	Contravention Sec. 21, sub. sec. 18a, Regulations.	McKenzie Sound.....	Fined \$200.00, seine boat "Greece II" and gear confiscated.
29	Kaichi, Hamaura.....	Contravention Sec. 21, s.s. 25, Regulations.	Pender Harbour.....	Case dismissed.
30	Petron Sande.....	Contravention Sec. 21, s.s. 18, Regulations.	Homako River.....	Fined \$15.00.
31	Victor Ferrario.....	Contravention Sec. 21, s.s. 29r, Regulations.	French Creek.....	Fined \$200.00.
32	James McPherson.....	Contravention Sec. 21, s.s. 21, Regulations.	Deepwater Bay.....	Fined \$25.00.
33	Billy Matilby.....	Contravention Sec. 21, s.s. 18a, Regulations.	Adams River.....	Fined \$100.00, seine boat "R.S." confiscated. Later returned to A.B.C. Packing Co. on payment additional \$500.00.
34	Billy Matilby.....	Contravention Sec. 21, s.s. 27, Regulations.	Adams River.....	Fined \$100.00.
35	Billy Matilby.....	Contravention Sec. 21, s.s. 21, Regulations.	Adams River.....	Fined \$100.00.
36	Sam Jasich.....	Contravention Sec. 21, s.s. 18b, Regulations.	Little Qualicum R.....	Case dismissed.
37	Dan Ambrose.....	Contravention Sec. 21, s.s. 18a, Regulations.	Marvins Bay.....	Fined \$25.00.
38	Pete Mitchell.....	Contravention Sec. 21, s.s. 4d, Regulations.	Kendrick Arm.....	Fined \$10.00.
39	Billy Assu.....	Contravention Sec. 21, s.s. 21, Regulations.	Deepwater Bay.....	Fined \$200.00.
40	Johnnie Ferry.....	Contravention Sec. 21, s.s. 21, Regulations.	Deepwater Bay.....	Fined \$200.00.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1928-29—*Concluded*

BRITISH COLUMBIA—DISTRICT No. 3—*Concluded*

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
41	Vance Dulcich.....	Contravention Sec. 21, s.s. 21, Regulations.....	Deepwater Bay.....	Fined \$100.00.
42	James Martin.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Fined \$100.00.
43	Frank Cvitanovich.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Fined \$25.00.
44	V. Antonia.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Fined \$25.00.
45	T. Nicolich.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Fined \$25.00.
46	F. Martin.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Fined \$25.00.
47	Louie Lewis.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Case dismissed.
48	Thomas Julian.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Case dismissed.
49	Basil Joe.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Case dismissed.
50	J. J. Norton.....	Contravention Sec. 21, s.s. 29r, Regulations.....	French Creek.....	Case dismissed.
51	T. Isogai.....	Contravention Sec. 6, s.s. 2, Regulations.....	Pender Harbour.....	Charge withdrawn.
52	Y. Isogai.....	Contravention Sec. 6, s.s. 2, Regulations.....	Pender Harbour.....	Case dismissed.
53	S. Wads.....	Contravention Sec. 6, s.s. 2, Regulations.....	Pender Harbour.....	Case dismissed.
54	T. Kamori.....	Contravention Sec. 6, s.s. 2, Regulations.....	Pender Harbour.....	Fined \$5.00.
55	Kazuo Uyaoka.....	Contravention Sec. 6, s.s. 2, Regulations.....	Pender Harbour.....	Fined \$5.00.
56	Dan Assu.....	Contravention Sec. 21, s.s. 18, Regulations.....	Blinkinsop Bay.....	Case dismissed.
57	Gilbert Cook.....	Contravention Sec. 21, s.s. 18, Regulations.....	Blinkinsop Bay.....	Case dismissed.
58	John T. Bevis.....	Contravention Sec. 21, s.s. 18a, Regulations.....	Pender Harbour.....	Fined \$10.00.
59	Peter Klein.....	Contravention Sec. 21, s.s. 18a, Regulations.....	Pender Harbour.....	Fined \$10.00.
60	William Rouse.....	Contravention Sec. 21, s.s. 2, Regulations.....	Garden Bay.....	Fined \$2.50.
61	Fred Klein.....	Contravention Sec. 21, s.s. 2, Regulations.....	Pender Harbour.....	Fined \$1.50.
62	Fred Klein.....	Contravention Sec. 21, s.s. 2, Regulations.....	Pender Harbour.....	Fined \$1.00.
63	Harry Brown.....	Contravention Sec. 36, Fisheries Act.....	Skutz Falls.....	Case dismissed.
64	Johnny Wilson.....	Contravention Sec. 21, s.s. 18a, Regulations.....	Jervis Inlet.....	Case dismissed.
65	Chief John.....	Contravention Sec. 21, s.s. 18a, Regulations.....	Jervis Inlet.....	Case dismissed.
66	Christopher Harmoller.....	Contravention Sec. 15, s.s. 1a, Regulations.....	Victoria.....	Fined \$20.00.

DOMINION OF CANADA

SIXTY-THIRD
ANNUAL REPORT
OF THE
FISHERIES BRANCH

Department of Marine and Fisheries

FOR THE YEAR

1929-30



OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1930

*To His Excellency the Right Honourable Viscount Willingdon, G.C.S.I.,
G.C.M.G., G.C.I.E., G.B.E., Governor General and Commander-in-Chief
of the Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of Your Excellency and the Parliament of Canada, the Sixty-third Annual Report of the Fisheries Branch of the former Department of Marine and Fisheries.

I have the honour to be,

Your Excellency's most obedient servant,

EDGAR N. RHODES,
Minister of Fisheries.

DEPARTMENT OF FISHERIES,
OTTAWA, August 30, 1930.

CONTENTS

Deputy Minister's Report, covering—	PAGE
Review of the Fisheries for the calendar year 1929.....	5
Foreign Trade in Fisheries Products.....	16
Operation of the Fish Inspection Act.....	17
Inspection of Canneries and Canned Fish.....	18
Work of the Marine Biological Board.....	19
Fish Culture.....	21
Fish Collection Services.....	27
Fisheries Intelligence Service.....	28
Scallop Investigations.....	29
Oyster Investigations in Prince Edward Island.....	29
Organization of Fishermen.....	30
Meetings of Fisheries Officers.....	31
Fishing Bounty.....	31
Pacific Coast Salmon Tagging.....	33
The North American Committee on Fishery Investigations.....	34
The International Fisheries Commission.....	35
The International Pacific Salmon Federation.....	36
The Pelagic Sealing Treaty.....	37

APPENDICES

1. Reports of Supervisors of Fisheries.....	38
2. Report of the Biological Board of Canada.....	132
3. Report of the Director of Fish Culture.....	167
4. Report of the Fisheries Engineer.....	243
5. Report on Scallop Investigations in 1929.....	250
6. Report on Oyster Investigations.....	255
7. Statement of Revenue and Expenditure, 1929-30.....	257
8. Statement of Revenue and Expenditure, 1867-1929.....	270
9. Entries of United States Fishing Vessels (Atlantic).....	282
10. Entries of United States Fishing Vessels (Pacific).....	284
11. Summary of Licences issued.....	288
12. Return of Prosecutions.....	291

Graphs showing Production of Principal Fishes, 1912-1929, appear after Appendix No. 12

DEPUTY MINISTER'S REPORT

To the Hon. E. N. RHODES,
Minister of Fisheries.

SIR,—I have the honour to submit the Sixty-third Annual Report of the Fisheries Branch of the former Department of Marine and Fisheries, which is for the fiscal year ended March 31, 1930, and deals with the following subjects:—

- Fisheries Operations in the Calendar Year 1929.
- Foreign Trade in Fisheries Products.
- Operation of the Fish Inspection Act.
- Inspection of Canneries and Canned Fish.
- Work of the Marine Biological Board.
- Fish Culture.
- Fish Collection Services.
- Fisheries Intelligence Service.
- Scallop Investigations.
- Oyster Investigations in Prince Edward Island.
- Organization of Fishermen.
- Meetings of Fisheries Officers.
- Fishing Bounty.
- Pacific Coast Salmon Tagging.
- Work of the North American Committee on Fishery Investigations.
- Work of the International Fisheries Commission, or Pacific Halibut Commission.
- The International Pacific Salmon Federation.
- The Pelagic Sealing Treaty.

The appendices to the report include:—

- Reports of the Supervisors of Fisheries.
- The Report of the Biological Board of Canada.
- The Report of the Fish Culture Division.
- The Report of the Fisheries Engineer.
- Reports on Scallop Investigations.
- The Report on Oyster Investigations.
- A Statement of Fisheries Expenditure and Revenue for 1929, and a Statement of Fisheries Expenditure and Revenue, by provinces, for the period 1867-1929.
- A Summary of Licences Issued in 1929.
- A Return Showing Prosecutions for Offences against the Fisheries Act.
- A Statement Showing the Entries of United States Fishing Vessels on the Atlantic Coast and on the Pacific Coast.

There is also included a series of graphs showing the production of various principal fishes, by years, in the period from 1912 to 1929, inclusive.

REVIEW OF THE FISHERIES OF 1929

During the calendar year 1929 there were larger catches of fish both on the Atlantic coast and in the Inland Fisheries but Pacific coast landings decreased by more than 80,000,000 pounds and as much of this decrease was in the salmon fishery the net result of the year's fisheries operations in the Dominion as a whole was that the marketed value of the production was about \$1,500,000 less than in 1928, or \$53,518,521 as compared with \$55,050,973.

Making comparison with 1927, however, there was an increase in 1929 of almost \$4,395,000 in marketed value, and it is also to be noted that the total for the year was more than \$2,900,000 above the average annual value in the preceding five-year period, 1924-1928. While the net decrease in total catch for the year was more than 63,000,000 pounds as compared with the catch for 1928, the average price per hundredweight received by the fishermen for their fish as landed was slightly better in 1929 than in the preceding year, taking the fisheries as a whole, and the landed value figures showed a decrease of only \$48,960, or \$33,699,543, as compared with \$33,748,503.

The sea fisheries production for the year amounted in marketed value to \$44,928,742, as against \$46,669,222 in 1928, but in the Inland Fisheries production, which totalled \$8,589,779, there was an increase of \$208,028. In New Brunswick, Manitoba, Prince Edward Island, Saskatchewan, and Alberta the marketed values showed gains but in British Columbia, Nova Scotia, Ontario, Quebec, and the Yukon Territory there were decreases.

Notwithstanding the decrease in its production, British Columbia continued well in the lead among the provinces in point of marketed value. Forty-five per cent of the production value for the Dominion for the year is to be credited to British Columbia, thirty-five per cent to the Maritime Provinces, eight per cent to the Prairie Provinces and the Yukon Territory combined, seven per cent to Ontario, and five per cent to Quebec.

On the Atlantic coast the total catch for the year was 536,193,900 pounds as compared with only 521,571,400 pounds in 1928. In Quebec alone among the four provinces of the coast was there a decrease in landings. In the Inland Fisheries the landings were 87,772,600 pounds, or about 2,000,000 pounds more than in 1928. On the other hand, the Pacific coast catch was only 526,127,400 pounds, as against 606,610,000 pounds in the preceding year.

Capital Investment.—The figures as to the amount of capital in use in the fishing industry in 1929 bear out the statement which was made in last year's report that "while there was some increase in the capital investment in the industry in 1928, the indications are that there will be a further increase in the ensuing years." During 1929 the total investment increased by more than \$4,000,000 and reached the sum of \$62,336,057. The greater part of the increase, or \$2,710,914, was in the capital invested in vessels and boats and gear used in the primary operations of catching and landing fish, and the total amount so invested reached \$33,842,002. The investment in fish canning and curing establishments was increased by \$1,552,772, notwithstanding that there was some decrease in the number of lobster and salmon canneries and in the number of reduction plants.

The growth in capital investment in the industry in recent years has been very striking. In 1910 the investment was slightly more than \$19,000,000. By 1914 it had become nearly \$25,000,000. During the war years, of course, there was some temporary employment of capital which swelled the figures abnormally, and for several years after the war's end there was a measure of recession. By 1922, however, conditions were returning to normal. In that year the investment in the industry was \$47,765,000, in round figures. In 1924 there was a sharp decrease but this change was followed in the next year by a renewed upward movement. This movement is apparently now continuing, and there is reasonable prospect of a further increase in investment during 1930, as is shown by the fact that on parts of the Atlantic coast, for instance, the activity in boat construction which was evident in the winter of 1928-29 has again been manifest during the present winter.

Personnel.—The year saw an increase of 2,154 in the number of persons directly employed in the fishing industry, and, all told, 80,373 were so engaged, as compared with 78,219 in the earlier year. Reckoning on the basis of an average of five dependents to each person employed in the industry, it will be

seen that the fisheries are a source of livelihood or maintenance for a number of people almost equal to the estimated population of the province of New Brunswick. Of the total personnel engaged in the industry last year 64,083 were men in primary operations, as compared with 62,785 in 1928, and 16,290 were persons employed in fish canning and curing establishments, an increase of more than 800 over the figures for the previous year.

Foreign Trade.—Export trade in fish and fish products in 1929 was not quite as large as in 1928—\$37,546,393, as compared with \$38,096,245—but it exceeded import trade by \$33,312,487. The value of fisheries imports was greater by some \$165,000 than it had been in 1928. Canadian fish and fish products continue to find sale in virtually all parts of the world but the major business is done with the United States in fresh and frozen fish.

Major Fisheries.—Notwithstanding that salmon fishing operations in British Columbia, the great salmon producing province, were less successful in 1929 than they had been in 1928, the salmon fishery ranked first in importance during the year from the standpoint of marketed return. In marketed value the products of the fishery were worth \$15,008,825. This total was nearly \$3,000,000 under the figures for the preceding year but was approximately equal to the 1927 total. The positions of the lobster and cod fisheries in the table of relative importance from the standpoint of marketed value were reversed in 1929 as compared with 1928. In the earlier year the cod fishery ranked second to the salmon fishery and the lobster fishery was third in importance. In 1929, however, the lobster fishery came into second place, with marketed value figures of \$5,696,542, or an increase of something more than \$512,000, and the cod fishery was third with a value of \$5,394,636, as compared with \$6,285,777 in 1928. Halibut marketed value was \$4,832,296, a gratifying increase of more than a million dollars. In the case of herring the marketed value of \$3,186,669 represented an increase of some \$80,000. The catch in the pilchard fishery, which is carried on in British Columbia only and has become of rapidly increasing importance with the growing utilization of the fish in producing fish meal and oil, was larger than it had been in 1928 but, in many cases, the oil content was not as great as it had been in the former year and the marketed value of the products of the fishery, \$2,199,834, showed a drop of some \$360,000. Whitefish continued the most valuable among the inland fishes and the landings had a marketed value of \$2,453,703, an increase of some \$260,000. As in 1928, the haddock, pickerel, sardine, smelt, and trout fisheries, respectively, yielded marketed returns of more than \$1,000,000.

Table I, below, shows the marketed value of the year's production by provincial totals as compared with the four preceding years. Table II shows the marketed value of Sea and Inland production by provinces for 1929.

TABLE I

	1929	1928	1927	1926	1925
	\$	\$	\$	\$	\$
Nova Scotia.....	11,427,491	11,681,995	10,783,631	12,505,922	10,213,779
New Brunswick.....	5,935,635	5,001,641	4,406,673	5,325,478	4,798,589
Prince Edward Island.....	1,297,125	1,196,681	1,367,807	1,358,934	1,598,119
Quebec.....	2,933,339	2,996,614	2,736,450	3,110,964	3,044,919
Ontario.....	3,919,144	4,030,753	3,670,229	3,152,193	3,436,412
Manitoba.....	2,745,205	2,240,314	2,039,738	2,328,803	1,466,939
Saskatchewan.....	572,871	563,503	503,609	444,288	494,882
Alberta.....	732,214	725,050	712,469	749,076	458,504
British Columbia.....	23,930,692	26,562,727	23,264,342	27,367,109	22,414,618
Yukon Territory.....	24,805	51,665	12,090	17,866	15,370
Total.....	53,518,521	55,050,973	49,497,038	56,360,633	47,942,131

TABLE II

	Sea	Inland	Total
	\$	\$	\$
Nova Scotia.....	11,427,491		11,427,491
New Brunswick.....	5,904,183	31,452	5,935,635
Prince Edward Island.....	1,297,125		1,297,125
Quebec.....	2,369,251	564,088	2,933,339
Ontario.....		3,919,144	3,919,144
Manitoba.....		2,745,205	2,745,205
Saskatchewan.....		572,871	572,871
Alberta.....		732,214	732,214
British Columbia.....	23,930,692		23,930,692
Yukon Territory.....		24,805	24,805
Total.....	44,928,742	8,589,779	53,518,521

NOVA SCOTIA

Most of the Nova Scotia fisheries were more successful in 1929 than they had been in 1928 but the situation was otherwise in the cod fishery, and it was this latter condition which brought about a decrease in the value of the provincial fisheries production as a whole. At the same time, the production for the year, \$11,427,491, though \$254,504 less than the total for 1928, was some \$600,000 greater than the production for 1927. There were increases in catch and marketed value in the haddock, pollock, hake and cusk, halibut, herring, mackerel, salmon, lobster, alewives, and clam and quahaug fisheries. The decreases were in the cod, swordfish, scallop, and sole fisheries. Cod landings fell off by nearly 18,000,000 pounds and marketed value by more than \$900,000. Lower prices in the dried fish trade, as well as the reduction in catch, affected the cod production value adversely. The total catch of fish made by the Lunenburg fleet, which operates chiefly for the dried fish trade, was smaller by some 9,000,000 pounds than in 1928—62,610,000 pounds in 1929 as compared with 71,722,500 pounds.

NEW BRUNSWICK

In 1928 there was an increase of nearly \$600,000 in the marketed value of New Brunswick's fisheries production, but 1929 saw even that success surpassed and the marketed value for the year was \$933,994 greater than the total for 1928, or \$5,935,635, as against \$5,001,641. The sea fisheries production was \$5,904,183, a gain of over \$930,000, and inland fisheries value of \$31,452 represented a gain of something more than \$3,000. The sardine fishery continued in first place, as regards marketed value of product, although there was a decrease in catch, with the lobster fishery in second place. Gains in these two fisheries and in the salmon, herring and the hake and cusk fisheries accounted, in major part, for the large increase in provincial marketed value. The pack of canned sardines, 329,204 cases, was greater by over 70,000 cases than the 1928 pack, and in marketed value there was an advance of over \$286,000. There was an increase of nearly 2,390,000 pounds in the lobster catch, which totalled 8,186,200 pounds, and the marketed value of the landings was \$1,361,796, as compared with about \$325,000 less than that in the previous year. There were very substantial increases in salmon and herring catches and value, and in the case of hake and cusk the catch increased largely and the marketed value, \$151,983, represented an increase of more than 100 per cent. There were increased returns from several other fisheries, such as the haddock and alewives fisheries, but the smelt, cod, pollock, mackerel, and shad fishermen did not fare so well as in 1928. Cod catch showed a decrease of some 3,000,000 pounds, and smelt landings a decrease of upwards of 900,000 pounds.

PRINCE EDWARD ISLAND

Larger returns from the lobster fishery were the main factor in the increase in the value of Prince Edward Island production, which increased from \$1,195,577 in 1928 to \$1,297,125 in the year just past. The lobster catch of 7,359,000 pounds was nearly 798,000 pounds above the 1928 figures, and in marketed value, \$813,206, there was a gain of some \$61,000. There was also a gain of over 1,400,000 pounds in the landings of hake and cusk, with an increase of \$20,379 in value, while the cod production was greater by some 1,300,000 pounds in catch and by nearly \$21,000 in value than it had been in the preceding year. There was an increase in oyster landings and oyster value, and an increase in mackerel value though a decrease in catch. The smelt fishery was less successful than in 1928.

QUEBEC

The decrease in marketed value in the case of Quebec's production was chargeable to the Inland Fisheries. Sea Fisheries production value, \$2,369,251, was \$119,673 greater than the 1928 total but in the Inland Fisheries the marketed value was only \$564,088, as compared with \$742,357 in the year previous. Taking the fisheries as a whole there was, thus, a net decrease of \$58,596 in the marketed value for 1929. In the sea fisheries there were gains in value in the case of cod, herring, smelt, and salmon, among the more important fishes, but the mackerel and lobster fisheries yielded smaller returns than in 1928. The increase in salmon value was particularly noteworthy, the total standing at \$137,144 as against only \$88,352 for the year before. Increasing trade is being done by Quebec in fresh salmon. In the inland fisheries the pickerel catch was less than half as large as in 1928, and the catch of eels also fell off to much the same extent, and these decreases explain by far the greater part of the drop in the value of the production from inland waters.

MANITOBA

Manitoba continued its fisheries progress during the year. Catch increased, and marketed value went \$504,891 beyond the 1928 total, reaching \$2,745,205. Whitefish catch was worth nearly \$617,000, a substantial gain. Tullibee landings decreased but marketed value \$585,350 increased by \$103,000, in round figures. Trout catch and value more than doubled. In the case of both the pickerel and goldeye fisheries the value returns were greater than in 1928, although the pickerel catch was smaller.

SASKATCHEWAN

In Saskatchewan there was a decrease of some 77,000 pounds in total catch but, nevertheless, the marketed return was greater by \$9,338. The pike, pickerel, mullet, and goldeye catches were all somewhat smaller than in the year before but there were larger landings of trout, tullibee, and whitefish. All told, more than 4,593,000 pounds of whitefish were taken, an increase of 226,000 pounds, and the marketed value total of \$461,348 was \$22,000 and more above the 1928 figures.

ALBERTA

Trout landings in Alberta again showed a substantial increase in 1929 and this condition was the main factor in bringing about an increase in the value of the production from provincial waters. The catch of trout was approximately 2,350,000 pounds, as compared with 1,937,100 pounds in 1928 and the marketed value of \$235,391 represented a gain of about \$13,000. Whitefish catch increased slightly but fell off in marketed value. Pike and tullibee catches were larger than in 1928 but there were decreases in the case of pickerel and perch.

BRITISH COLUMBIA

Much smaller runs of pink and chum salmon than had occurred in 1928 combined with bad weather conditions in some parts of the province led to a large decrease in the salmon landings in British Columbia and a drop of more than \$3,000,000 in the marketed value of salmon production. In 1928 the salmon catch totalled 225,745,500 pounds and the marketed value of the fish was \$17,345,670, but in 1929 the catch fell to 151,403,800 pounds and the value to \$14,265,795. It is to be remembered, however, that 1928 was one of the three most successful years in the history of the British Columbia salmon industry, and the 1929 value total, though less than that of 1928, was slightly larger than the figures for 1927. There was also a large decrease in herring catch and value in 1929 and though the pilchard landings went above the 1928 catch the marketed value showed a decrease. On the other hand, the return from the halibut fishery showed betterment. The gain in catch was small but the production value was \$4,317,235 as against \$3,370,670 in 1928.

YUKON TERRITORY

Production value in the Yukon Territory in 1929 was less than half what it had been in 1928, or \$24,805 as compared with \$51,665, but 1928 was an exceptional year in the fisheries of the territory and it was scarcely to be expected that the returns from fishing operations would continue steadily on the high level which was then reached. Moreover, it is to be noted that while the marketed value of the catch for 1929 was much less than the value for the preceding year it was double the figures for 1927.

ATLANTIC COAST RESULTS

In the four Atlantic coast provinces—Nova Scotia, New Brunswick, Prince Edward Island, and Quebec—the year's catch of sea fish was 536,193,900 pounds with a marketed value of \$20,998,050—a gain of 14,200,000 pounds in catch, roundly stated, and of over \$890,000 in value. There were increased landings everywhere, except in Quebec, and the catch figures by provinces were as follows:—

	Pounds
Nova Scotia.....	274,906,400
New Brunswick.....	156,186,200
Quebec.....	80,760,900
Prince Edward Island.....	24,340,400

Cod, Haddock, Hake and Cusk, and Pollock.—Taking the coast as a whole, there were larger catches of haddock and of hake and cusk in 1929 than there had been in the previous year but smaller landings of cod and pollock. The net result was that the total landings of the fish in this group was only 291,763,200 pounds, as compared with 294,942,000 pounds in 1928. Marketed value decreased from \$8,493,938 in 1928 to \$7,945,532.

The decline in cod fishery returns was general, except in Prince Edward Island. All told, the catch was 197,883,200 pounds, as against 214,982,200 pounds in the year before; marketed value was \$5,391,627, as compared with \$6,284,284. The major cod production is in Nova Scotia and the catch for that province for the year was 129,784,100 pounds, while in 1928 it had been 147,017,200 pounds.

In the haddock fishery there was a gain in the case of Nova Scotia, the big producer, and in the case of Prince Edward Island, while New Brunswick and Quebec productions decreased. The total catch was 54,540,900 pounds, with Nova Scotia accounting for 51,614,900 pounds. The Prince Edward Island increase was relatively large but the total landings for the province were only 175,900 pounds. New Brunswick's catch of 2,750,100 pounds was slightly smaller than a year ago. No haddock were taken by Quebec fishermen,

although in 1928 they landed upwards of 600,000 pounds. So far as marketed value is concerned, there was an increase of about \$217,000 on the coast as a whole, with the 1929 total reaching \$1,951,642.

There were large increases in hake and cusk catch in all three of the Maritime Provinces but Quebec, which had a catch of some 380,000 pounds in 1928, made no landings last year. The combined catch for Nova Scotia, New Brunswick, and Prince Edward Island was 33,912,200 pounds, a gain of 8,600,000 pounds and more, and marketed value of \$517,296 represented an increase of nearly \$150,000.

Pollock are taken only by Nova Scotia and New Brunswick fishermen, and while the Nova Scotia men were considerably more successful in 1929 than they had been in the preceding year the case was quite otherwise with the fishermen of the other province. In 1928 the New Brunswick catch of pollock was more than 3,411,000 pounds, with a marketed value of \$55,297, but in 1929 the catch fell away very sharply and amounted only to 846,600 pounds with a marketed value of \$15,998. Nova Scotia's catch, valued on the market at \$68,969, was 4,571,300 pounds, or an increase of over 1,500,000 pounds.

There was a production of smoked fish and smoked filets from this group of fish totalling 10,453,100 pounds, which was somewhat less than for the preceding year when 11,132,700 pounds were cured in this manner. The quantity of fish marketed fresh and in the fresh fillet form also fell off considerably, and was only 34,282,100 pounds, as compared with 37,904,800 pounds in 1928. There were 54,997,400 pounds of dried and boneless produced while in the year previous 57,468,200 pounds were processed in this form.

Herring, Mackerel, and Sardines.—In 1928 the combined landings of herring, mackerel, and sardines were greater by more than 5,000,000 pounds than they had been in 1927, and 1929 saw a further increase of 10,000,000 pounds and more, or a total of 159,872,100 pounds. Marketed value for the year was \$3,538,095, a gain of some \$650,000. Herring and mackerel increased both in catch and value and though the sardine catch of 49,838,800 pounds—virtually all to be credited to New Brunswick—was smaller by 7,359,000 pounds than the 1928 catch, it had a value of \$1,626,764 as against only \$1,291,722 in the previous year. The pack of canned sardines, valued at \$1,319,584, was 329,204 cases, or an increase of 71,323.

In the mackerel fishery there were smaller landings in New Brunswick, Prince Edward Island, and Quebec than there had been in 1928, but in Nova Scotia the catch increased heavily. The latter gain more than offset the decreases elsewhere and the total mackerel catch for the coast was 15,275,600 pounds, or about 2,800,000 pounds more than in the earlier year.

Except in the case of Quebec, there were increased herring catches—large increases in New Brunswick and Nova Scotia and a smaller gain in Prince Edward Island. Combined, the catches for the four provinces were 94,757,700 pounds with a marketed value of \$1,375,310, as compared with a total landing of 80,094,300 pounds and a value of \$1,060,840 in 1928.

Flounders, Halibut, Swordfish.—Flounder fishing, which is carried on in Nova Scotia and New Brunswick only, yielded a total catch of 462,600 pounds, a gain of 115,000 pounds, and the marketed return was \$19,243, as against \$14,304 in 1928. The increase in catch was in Nova Scotia. The halibut fishery is prosecuted chiefly in Nova Scotia waters where the landings for the year were 3,097,100 pounds, an increase of half a million pounds. In Quebec the catch was 73,300 pounds, or a drop of 53,600 pounds. The New Brunswick fishermen tripled their catch but their total landings were slightly less than 20,000 pounds. Halibut are not often taken in Prince Edward Island waters.

MARINE AND FISHERIES

Swordfishing, carried on in Nova Scotia only, was less successful than in 1928. The catch was 633,600 pounds, a decrease of 175,000 pounds, and marketed value \$98,241 as compared with \$132,345.

River Spawning Fish.—The catch of alewives showed a large increase, there was a substantial increase in the salmon catch, and the smelt catch decreased considerably. Similarly, there were gains in marketed value in the case of the first two varieties of fish and there was a decrease in the case of smelts. By fisheries the year's results were as follows:—

	Alewives	Salmon	Smelts
	lbs.	lbs.	lbs.
Catch.....	6,741,800	3,528,700	7,463,000
Marketed value.....	\$121,938	\$710,315	\$1,112,066

New Brunswick and Nova Scotia are the principal producers of alewives. The New Brunswick catch increased greatly and the Nova Scotia catch doubled. In the smelt fishery there was a decrease in the landings in New Brunswick, the largest producer, and a decrease also in Prince Edward Island. In Nova Scotia there was an increase, and the Quebec catch of 693,400 pounds was more than double the 1928 total for the province. Salmon catch increased in all the provinces except Prince Edward Island, where the landings are never large. In New Brunswick the catch was 1,765,000 pounds, as compared with 1,220,900 pounds in 1928; in Quebec it was 1,005,400 pounds, as compared with 739,200 pounds; and in Nova Scotia 755,600 pounds, as compared with 705,900 pounds.

Lobsters.—The total catch of lobsters for the four Atlantic provinces was 37,282,000 pounds, or an increase of more than 5,000,000 pounds over the catch for the preceding year. The marketed value was \$5,696,542, or \$642,000 greater than in the previous year, placing the lobster industry second value of return among the Canadian fisheries in 1929.

The following tables show the lobster catch, by provinces, for 1929, 1928 and 1927, the forms in which the catch was marketed in each year, and the marketed values:—

CATCH

	1929		1928		1927	
	Cwt.	Marketed value	Cwt.	Marketed value	Cwt.	Marketed value
		\$		\$		\$
Nova Scotia.....	190,035	3,210,504	172,409	3,048,255	179,673	3,255,627
New Brunswick.....	81,862	1,361,796	57,970	1,037,195	49,752	955,053
Prince Edward Island.....	73,590	813,206	65,613	752,123	62,800	855,917
Quebec.....	27,333	311,036	26,445	216,126	24,606	359,579
Totals.....	372,820	5,696,542	322,437	5,053,699	316,831	5,426,176

QUANTITY SHIPPED IN SHELL

	1929		1928		1927	
	Cwt.	\$	Cwt.	\$	Cwt.	\$
Nova Scotia.....	73,582	1,593,128	66,239	1,525,674	67,651	1,492,350
New Brunswick.....	26,995	664,042	24,384	583,833	16,162	431,870
Prince Edward Island.....	7,595	109,639	6,791	99,137	1,847	40,817
Quebec.....	2,202	30,574	492	6,708	1,147	14,022
Totals.....	110,374	2,397,383	97,906	2,215,352	86,907	1,979,059

QUANTITY CANNED

	1929		1928		1927	
	Cases	Marketed Value	Cases	Marketed Value	Cases	Marketed Value
		\$		\$		\$
Nova Scotia.....	60,661	1,569,965	55,277	1,465,239	55,771	1,727,105
New Brunswick.....	27,146	647,659	19,468	451,165	18,866	522,162
Prince Edward Island.....	28,399	686,940	25,077	635,427	27,896	801,542
Quebec.....	11,310	274,458	12,164	332,091	11,404	342,289
Totals.....	127,516	3,179,022	111,986	2,883,922	113,937	3,393,098

TOMALLEY

	1929		1928		1927	
	Cases	\$	Cases	\$	Cases	\$
Nova Scotia.....	3,151	34,803	3,226	38,322	2,536	31,838
New Brunswick.....	155	970	197	2,197	103	1,021
Prince Edward Island.....	695	9,127	799	10,759	630	9,558
Quebec.....	515	6,004	645	7,616	280	3,028
Totals.....	4,516	50,904	4,867	58,894	3,549	45,445

Other Shellfish.—There was an increase of 3,000 barrels in the quantity of clams and quahaugs taken, 49,482 barrels being landed all told. The production in New Brunswick, where the greatest quantities are taken, fell off somewhat but in Nova Scotia the landings were more than 3,000 barrels greater than in the previous year. In Prince Edward Island the quantity was 4,275 barrels, or nearly double that of the previous year. Quebec showed decreased landings. There were fewer scallops taken, however, the total landings of 17,921 barrels being less than that of the previous year by nearly 8,400 barrels. There were almost 1,700 barrels more of oysters landed than in 1928, the total for 1929 amounting to 20,734 barrels. Oyster production showed an increase in New Brunswick and Prince Edward Island and a slight drop in Nova Scotia.

INLAND FISHERIES

The quantity of fish taken in the Inland Fisheries—that is, from the fresh water areas of New Brunswick, Quebec, Ontario, the Prairie Provinces, and the Yukon Territory—was considerably greater in 1929 than in the previous year. Similarly, there was an increase of some \$200,000 in marketed value, and as compared with the value total for 1927 there was an increase of over \$1,000,000. In 1927 the marketed value of the inland fisheries production was \$7,575,912, in 1928 it was \$8,381,751, and last year it reached \$8,589,779, a record figure.

The catches of the principal varieties of fish taken in the inland waters in 1929 are shown in the following table, together with the catches made in 1928 and 1927, respectively:—

	1929	1928	1927
	lbs.	lbs.	lbs.
Whitefish.....	19,638,600	18,069,500	18,566,400
Pickereel (or dore).....	12,850,000	14,261,000	14,001,900
Tullibee.....	9,766,900	10,414,500	12,176,400
Trout.....	9,065,600	9,007,500	8,990,400
Pike.....	8,254,600	6,270,100	7,047,300
Herring.....	5,456,200	5,999,300	6,320,100
Perch.....	6,482,700	5,175,100	3,318,900
Eels.....	1,265,700	2,324,000	1,455,200
Blue pickereel.....	2,583,100	2,149,600	3,117,300
Mullets.....	1,992,600	1,606,500	1,590,600
Carp.....	1,345,100	1,349,700	1,275,800
Goldeyes.....	1,115,100	1,071,300	1,148,500

So far as other varieties of fish are concerned, it may be noted that there were larger catches of alewives, bass, maskinonge, saugers, shad, and sturgeon than in 1928 but smaller landings of catfish, salmon and smelts.

Ontario was the largest producer of whitefish, with landings totalling 6,159,000 pounds, in round figures, or about 325,000 pounds more than in the preceding year. The whitefish catches in the three Prairie Provinces were also larger, in each case, than in 1928.

Manitoba continued the largest producer of pickerel, although the catch in the province was somewhat under the figures for 1928—9,405,500 pounds in 1929 as compared with 10,187,000 pounds. The Ontario catch, 1,989,000 pounds, was smaller than in 1928. The Saskatchewan catch, 283,500 pounds, and Alberta's catch, 811,500 pounds, also showed some decrease.

Pike were landed in largest quantity in Manitoba and the catch of 5,491,000 pounds exceeded the 1928 landings by some 1,800,000 pounds. There were also larger landings in Quebec, Ontario, and Alberta, but a decrease in Saskatchewan.

THE PRAIRIE PROVINCES

Expansion of production in the Prairie Provinces was again noteworthy in the Inland Fisheries during the year. All told the Prairie Province production had a marketed value of \$4,050,290, or over half a million dollars more than in 1928. This was the first year in which Prairie Province production had passed the \$4,000,000 mark, and it is also to be noted with satisfaction that since 1924 there has been an increase of nearly 100 per cent in the marketed value of fisheries production in this part of Canada. The 1929 marketed value for Manitoba alone, \$2,745,205, was greater by nearly \$700,000 than the total for the three provinces in 1924. It is in Manitoba, of course, that the greatest fisheries expansion has been taking place, but there has been steady progress in Saskatchewan and Alberta as well. In 1929 Saskatchewan's catch had a marketed value of \$572,871, a gain of a little more than \$9,300 over the figures for 1928, and in Alberta marketed value was \$732,214, an increase of approximately \$7,100 over the total for the preceding year.

The trend toward further expansion, which was indicated by increase in equipment in the three provinces in 1928, was again shown in the same way in 1929, as well as by enlargement of personnel. Capital investment and number of employees was greater in the case of each province than it had been in the year before. Total capital investment in the three provinces was \$1,986,036, a gain of \$396,335, and the number of employees rose from 6,657 in 1928 to 7,516. Expansion in commercial fisheries operations in these western provinces has been very noteworthy in recent years and there is encouraging promise of further steady development as new fishing waters are made accessible to the fishermen by advancing settlement and railway extension.

As in 1928, there was an increased interest in angling apparent in 1929 in all three provinces. In Alberta, for instance, where a new high level in the number of angling permits was reached in the earlier year, there was a large further increase in 1929. In Manitoba the number of licences sought by non-resident anglers almost doubled, totalling 2,039, as compared with 1,113 in the previous year. In Saskatchewan there was also a considerable increase in the number of anglers. Beneficial results from fish cultural operations of the department were observable in several parts of the provinces where anglers found excellent fishing in waters, previously lacking in sport fish or possessing limited resources, which were stocked with fry several years ago.

In Manitoba considerable interest attached to the operations of the "Fish Pool," which was incorporated in 1928 under the Manitoba Co-operative Societies Act as the Manitoba Co-operative Fisheries. The pool completed its first year of operations in August, having handled a total of 9,996,131 pounds of fish which were received from 477 pool members and 200 non-members.

PACIFIC COAST FISHERIES

In British Columbia the sharp drops in the catches of pinks and chums, which have already been noted, had the effect of reducing the pack of canned salmon very materially and the total production was only 1,398,857 cases, as compared with 2,035,637 cases in 1928. It is to be remembered, however, that the runs of pinks and chums in 1928 were exceptionally large and record making quantities of each of these two varieties of salmon were canned. The 1929 pack of pinks, 477,969 cases, was 314,000 cases smaller than the 1928 pack and canned chum production, 424,982 cases, was less than half the size of the pack for the preceding year. On the other hand, the pack of sockeye was more than 77,000 cases larger than in 1928 and totalled 281,306 cases, while a pack of 174,198 cases of cohoes and a pack of 19,377 cases of springs both represented gains, although in marketing springs and cohoes the trend is toward their increasing use in the trade in fresh and frozen fish.

Two developments of interest in connection with the salmon runs were the migration of a relatively large number of sockeye to the upper spawning areas of the Fraser River system in the earlier part of the season and the showing of pinks in the Skeena and Central divisions. The early run of sockeye to the Fraser, fish unexcelled for canning purposes, had been practically negligible since 1917. When the run appeared in 1929 it took the fishermen largely by surprise with the result that many of the fish were able to reach the spawning areas, which are consequently believed to have been well seeded. In the case of pink runs to the Skeena and Central divisions there was some apprehension caused in 1927 when the runs were unprecedentedly light. It was felt that the small number of fish, coupled with unfavourable conditions then existing as to height of water in streams containing the spawning grounds, might make doubtful the future runs in these divisions. In order to meet the situation as far as possible drastic conservation steps were taken during the 1927 season, and apparently with effectiveness as both in the Skeena and the Central areas in 1929 the indications were that the spawning grounds were at least reasonably well seeded.

In the canned salmon export markets Australasia was British Columbia's largest customer in 1929. Australasian purchases amounted nearly to 308,000 cases. Purchases by France totalled over 251,000 cases and by the United Kingdom over 194,000. In addition to the shipments to France, over 275,000 cases were sold in continental Europe, and of this quantity Italy took nearly half. Some 43,000 cases went to South Africa and West Africa. Over 23,000 cases were exported to the Atlantic coast of the United States. Altogether, upwards of thirty countries imported British Columbia canned salmon during the year.

In the pilchard industry, which of late years has become one of the chief fisheries enterprises of the Pacific coast, a feature of the 1929 season was a relatively large increase in the output of the canned product which rose from a little more than 65,000 cases in 1928 to 98,821 cases. Production of meal and fertilizer from pilchards, 15,826 tons, was slightly larger than in the previous year, but on the other hand, there was a substantial decrease in the output of pilchard oil. Over 3,995,000 gallons of this oil were manufactured in 1928, but in the past year the quantity was only 2,856,579 gallons. The decrease was not due to diminished operations, but rather to the fact that the 1929 run of fish were generally less oily than those taken in the earlier year.

The total production of fish oil of all kinds in the province during the year was 4,066,015 gallons, as compared with some 5,047,000 gallons in 1928. In the case of fish meal and fertilizer, the total production was 21,084 tons (the figures including some whalebone), which was slightly more than the 1928 quantity.

The quantity of dry-salted herring produced, approximately 92,385,000 pounds, was nearly 15,000,000 pounds under the total for the year before but, none the less, had only four times been exceeded in the history of the industry. Practically the entire pack of dry-salted herring is exported to the Orient where British Columbia producers have built up a large trade in recent years.

The landings of halibut amounted to 30,436,400 pounds, exceeding the total for 1928 by 1,500,000 pounds. Whaling operations were more successful than they had been in 1928 and 407 whales were killed, as compared with 305 in the earlier year. Fur seals to the number of 3,347 were taken by Indians, the only persons by whom these seals may be killed under the terms of the Pelagic Sealing Treaty, as against 2,090 in 1928.

FOREIGN TRADE IN FISHERIES PRODUCTS

Returns compiled by the External Trade Branch of the Bureau of Statistics show that Canada exported fish and fish products to the value of \$37,546,393 in the calendar year 1929 and imported like products having a value of \$4,233,906. The balance of trade in Canada's favour was thus \$33,312,487.

Sales to the United States (\$16,750,543) and the United Kingdom (\$3,693,615) accounted, all told, for more than half of the export business during the year, but it may be said that the Dominion marketed fisheries products in virtually all the world. Every continent was a purchaser of products from Canada's fisheries. Canned salmon was marketed in some thirty different countries. Canadian dried fish found sale in large quantities in more than twenty foreign markets, although it may be pointed out in passing that there is increasing competition from Iceland and Norway in certain important marketing areas. Canadian canned sardines were exported to upwards of twenty lands. Fresh and frozen fish was marketed in the United States, in the United Kingdom, in Germany, and in France, and in larger total than before. Canadian export trade in the products of the fisheries has increased with great rapidity in recent years and with the further expansion of operations that is now in progress, and the widening application of new and improved methods of handling fish which the department and the Biological Board have been assisting to develop, continued increase may be expected with reasonable confidence.

Exports of canned or preserved fish had a value in 1929 of nearly \$13,260,000, or, in other words, they represented more than one-third of the total value of the year's fisheries exportation. The principal items under this head were: Canned salmon, slightly more than \$8,865,000; canned lobsters, \$3,113,630; and canned sardines, a little more than \$578,000.

Sales of fresh and frozen fish amounted nearly to \$11,725,000. United States purchases went beyond the eleven million dollar mark. The remaining sales were made in the United Kingdom and in continental Europe.

The exports of dried, salted, smoked, and pickled fish had a total value of over \$9,979,000, cod and haddock accounting for well over half the sum. An interesting item under this head shows exportations to the Orient of dry-salted herring, having a value of \$1,948,556. Development of this export trade in dry-salted herring, a British Columbia undertaking, has been of comparatively recent origin but the annual sales to Oriental markets have reached a place of first-rate importance. Another important development in export trade has been the upbuilding of a large business in fish meal, and in 1929 the sales of this commodity abroad had a value of over \$826,000.

Fisheries importations in 1929 came chiefly from the United States and from Newfoundland, although there was also import trade with the United Kingdom amounting to slightly less than \$245,000. As is shown by the figures already cited, however, the value of the exports from Canada during the year was nearly nine times as great as the value of the products imported. The

purchases from the United States, including Alaska, amounted in value to \$1,437,697. Of this amount, nearly one-third was accounted for by the importation of oysters, which Canada does not produce in sufficient quantity to meet the demand. The purchases of Newfoundland fish had a value of \$822,927 but they included very considerable quantities of fish and lobsters which were brought in mainly for purposes of re-export. These latter importations included dried fish having a value of \$178,000, in round figures, canned lobsters valued at slightly more than \$107,000, and approximately \$145,000 worth of wet-salted fish which was further processed in Canada. The larger items in the imports from the United Kingdom were pickled, canned, and smoked herring, which represented, in value, more than half the total purchases made from the Old Country. There was also importation of herring in various forms from the United States and Newfoundland. For the most part, importations of this kind could be displaced by Canadian herring which are fully equal in quality to imported fish. Save in the exceptional case, indeed, there is no reason for the purchase of any imported fish. Canadian fisheries products are not surpassed anywhere and they are obtainable in such variety that the supply is capable of meeting any demand of the domestic market.

INSPECTION OF FISH, BARRELS, ETC.

The inspection of cured fish, the packages in which they are marketed, etc., is carried on under the Fish Inspection Act. Until the year 1922 pickled herring, mackerel, gaspereau and salmon and the containers for such only came under inspection. As the Act provides, however, that any kind of cured fish may, by Order in Council, be made subject to inspection, just as soon as the wisdom for taking such a step became apparent, the dry-salted herring trade between British Columbia and China was brought under the provisions of the Act in that year. With the approval of the packers in British Columbia, a code of regulations dealing with this branch of trade was prepared and put in effect in the fall of 1922. This trade, for some time had been struggling with a difficulty due to lack of uniformity in the curing of the fish, the size of the package and the weight of fish contained in each. The regulations now in effect have remedied these defects. With each lot of fish inspected and shipped a certificate of inspection is given to the shipper and the result has been stabilization of the business.

The large and important trade between Eastern Canada and the West Indies in smoked herring for some years appeared to be in danger from causes similar to those which threatened the dry-salted trade between British Columbia and China, that is lack of uniformity in size of packages in which the fish were packed and a gradual reduction in the recognized weight of fish each package should contain. In order to remove these disabling conditions and with a view to stabilizing the business, regulations were framed, in consultation with the producers of this commodity, in which were laid down standards for the curing and smoking of the fish, for the size of the packages and the weight of their contents. These were put in effect in 1923.

To enable inspecting officers to more definitely deal with the inspection and sale of standard barrels, authority was obtained in 1923 by Order in Council to permit of the inspection at the coopers' shops of all barrels intended for the packing and marketing of such fish as came under the provisions of the Act. The inspecting officers operated under this authority in 1924 for the first time with results that have gratified both the department and the trade.

Two years ago, the department, after consultation with the trade, established by law standards of size and quality for dry and salted cod, haddock, hake, cusk and pollock. This was done as a result of representations to the effect that there were no well defined standards on which sellers and buyers

of these fish could base just and reasonable prices. The same price is usually paid for fish that are not well cured as for fish that are well cured; consequently, fishermen who cure their own fish have no incentive to improve the quality of their cure.

The standards thus established have been incorporated in the regulations to the Fish Inspection Act. The department's inspectors of fish curing and packing have been empowered to carry out such inspections as may be required. Inspection is not compulsory. The purpose simply is, for the present, to provide a means of guarding alike the interests of the fisherman and the dealer, when the former agrees to sell and the latter to buy dry or green salted fish in accordance with the established standards, at a price conditional upon the fish at the time of delivery being such as the standards require. Both seller and buyer in that event have an opportunity of requesting the nearest fish inspection officer to inspect the fish in question and decide as to whether they are up to the standard agreed upon.

Last year the provisions of the Fish Inspection Act were extended to embrace the inspection of all fish curing establishments and places where fish are cleaned, salted, smoked or otherwise prepared for curing, with the exception of canneries, which are inspected under the Meat and Canned Foods Act, together with all utensils and equipment used in the process of cleaning, salting, smoking or otherwise curing of fish.

A comprehensive set of regulations has been framed to govern the inspection of such establishments, which became effective on the first of January this year.

Prior to the present year inspection of fish under the Fish Inspection Act has been carried out by a special staff of officers, which to some extent duplicated the regular departmental staff of fishery officers on the coast. With a view to putting a stop to this duplication, it was decided last year to place the duty of carrying out the provisions of the Fish Inspection Act in the hands of one staff of officers, namely the fishery overseers, with the title of fisheries inspectors. In order that they might be qualified to undertake this work, all the sea fishery officers on the Atlantic coast were given a six weeks' course of instruction by the staff of the Experimental Station of the Biological Board. At the end of the course a stiff qualifying examination paper was set. Most of the officers succeeded in qualifying either fully or provisionally and are now acting as inspectors of fish, etc. Owing to the greater number of officers thus available for this work and the smaller districts they will have to oversee, it is assured that the work of inspection will be more efficiently and more beneficially handled in future. Also the qualified officers are being gradually trained to instruct fishermen in improved methods of handling and curing their fish.

During the year 1929-30 there were inspected on the Atlantic coast 63,467 empty containers; 11,406 packages of salted mackerel; 34,064 packages of salted herring; 8,335 packages of salted alewives; 81 packages of salted salmon; 65,516 packages of smoked herring; and 120,222 pounds of salted codfish.

On the Pacific coast during the same year there were inspected 238,866 boxes containing 400 pounds each of dry salted herring for the oriental markets.

INSPECTION OF CANNERIES

The inspection of fish canneries of all kinds throughout Canada, the raw material to be used therein, the whole process of canning, the canned product and the labelling and designating of such, are carried on by the ordinary fishery officers of the department under the provisions of the Meat and Canned Foods Act.

This inspection has for its object the extension of trade by improving the quality of the product and the protection of the public by preventing the packing of unsound fish and insisting on the correct labelling of all cans of fish. During the spring of 1922 it was discovered that the Act, as well as the regulations, which were amended in 1917 and 1919, contained several sections which were either burdensome to the trade or incapable of proper application. Officers of the department met the packers and discussed the whole Act and the regulations with them in order that amendments could be made to such an extent as was necessary for the proper protection of the packer, the consuming public and for the betterment of the industry. A series of amendments was finally agreed upon, made law and became effective at the beginning of the packing season of 1923.

For many years the preparation of the annual pack of canned lobsters caused loss to the trade owing to the discolouration of the meat which took place after it had been in the cans for some time. At the instigation of the Department, Dr. Harrison, of McGill University, endeavoured to find the cause of the discolouration. He discovered both the cause and the cure of it, and these were made known to the industry in a pamphlet in 1923. At the same time the department arranged with the Marine Biological Board to carry on a campaign of education amongst the canners with a view to eliminating causes of deterioration in the packing.

MARINE BIOLOGICAL BOARD

The Biological Board acts as the Scientific Division of the Fisheries Branch and maintains five research stations, three of which are mainly concerned with the more purely scientific and fundamental problems, while the other two, known as Fisheries Experimental Stations, deal with problems arising in connection with the handling and preservation of fish.

Three of the stations are located on the Atlantic Coast, the Atlantic Biological Station at St. Andrews, N.B., the Eastern Passage Laboratory at the entrance to Halifax harbour, and the Atlantic Fisheries Experimental Station at Halifax. The other two are on the Pacific coast, the Pacific Biological Station at Nanaimo, B.C., and the Pacific Experimental Station at Prince Rupert, B.C. In addition a field station is located at Cultus Lake, B.C., for the study of the sockeye salmon, and by courtesy of the University of Manitoba laboratory facilities have been provided for carrying on investigations of the prairie lakes.

In connection with the St. Andrews station further experimental work was carried on in the production and sale of Ice Fillets of various kinds of fish. Amongst other things a biological survey of the waters of the Bay of Fundy was carried out; experiments to determine the significance of certain conditions of aquatic life; studies of the decomposition of fish; the food value of marine products; investigation of the oyster fisheries of Prince Edward Island with a view to developing rational cultural practice. In the Inland waters a study was made of fresh water shrimps with a view to their culture as fish food; a survey of the lakes and streams of Prince Albert national park with a view to the conservation and development of the fisheries there. An extensive study of the whitefish of the Manitoba lakes was completed.

At the Halifax station investigations of problems connected with refrigeration were continued. Experimental work in the smoking, salting and drying of fish was carried further forward. Experiments in the canning of brine frozen mackerel and of scallops were conducted as also an investigation of the presence

of small crystals in cans of lobster. The effect of freezing of fish livers on the production of oil meal was further investigated. Routine analysis of fish meal samples submitted by the industry were carried out.

A course of instruction of six weeks' duration was again given for fishermen. The fishery officers were also given a six weeks' course. The Halifax station staff also took a large part of the instruction given in connection with the Fisheries course at Dalhousie University; a member of the staff visited the lobster canneries at the Magdalen islands and gave demonstrations with respect to the importance of speed and cleanliness in canning procedure. An exhibit of brine freezing methods was made at the Provincial Exhibition at Halifax and at the Fisheries Exhibition at Lunenburg.

In connection with the Pacific Biological Station, Nanaimo, B.C., investigations with regard to the propagation of sockeye salmon at Cultus lake were continued and extended. Studies of the life-history and spawning habits of pink and chum salmon were made at the Queen Charlotte islands. The salmon tagging program to secure information as to the migration routes of the various kinds of Pacific salmon was continued. Studies of sockeye salmon scales were continued and a comprehensive investigation of the herring and pilchard was commenced. Studies of shrimps, clams, trout and ling-cod and of the physico-chemical and plankton conditions in the strait of Georgia were carried on. A two weeks' course of instruction was given by the station staff to superintendents of fish hatcheries.

At the Prince Rupert station further investigation of the discoloration of halibut was conducted. A bacteriological investigation of the storage of salmon in fishing vessels was begun and continued.

Experiments were conducted with a view to a greater use of fish oil for industrial purposes. The production of glue from waste liquors of fish meal plants was investigated. Researches are in progress for the purpose of developing methods for the production of fish meal at its optimum value in nutrition.

The composition of the board and its various committees during the year was as follows:—

- Prof. J. P. McMurrich, University of Toronto, Chairman.
- J. J. Cowie, Esq., Department of Fisheries, Secretary-treasurer.
- Prof. A. T. Cameron, University of Manitoba.
- Prof. C. J. Connolly, St. Francis Xavier University.
- Prof. P. Cox, University of New Brunswick.
- John Dybhavn, Esq., Prince Rupert, B.C.
- Prof. J. N. Gowanloch, Dalhousie University.
- Prof. A. Vachon, Laval University.
- Prof. A. H. Hutchinson, University of British Columbia.
- Prof. W. T. MacClement, Queen's University.
- Prof. Marie-Victorin, University of Montreal.
- Prof. E. E. Prince, Ottawa.
- J. A. Rodd, Esq., Department of Fisheries.
- Prof. W. P. Thompson, University of Saskatchewan.
- A. H. Whitman, Esq., Halifax.

Prof. A. Willey, McGill University.
Prof. H. G. Perry, Acadia University.
Dr. R. C. Wallace, University of Alberta.

The members of the board receive no pay, but are allowed travelling expenses in connection with the Board's work and its meetings.

The Central Executive Committee consisted of:—

Prof. J. P. McMurrich,
Prof. W. T. MacClement,
J. J. Cowie,
Prof. E. E. Prince,
Prof. A. Willey,
Prof. Marie-Victorin.

The Atlantic Sub-Executive Committee consisted of:

A. Handfield Whitman, Chairman,
Prof J. N. Gowanloch,
Prof. C. J. Connolly.

The Pacific Sub-Executive Committee consisted of:

John Dybhavn, Chairman,
Prof. A. H. Hutchinson,
Prof. A. T. Cameron.

The Research Committee on Fish Culture consisted of:

Dr. A. G. Huntsman, Chairman,
Dr. W. A. Clemens,
Dr. A. H. Leim,
Prof. A. T. Cameron,
Mr. J. A. Rodd,
Dr. R. E. Foerster, Secretary.

A detailed report on the work of the Board's staff during the year will be found in Appendix No. 2 of this publication.

FISH CULTURE

The fish cultural operations of the department during the calendar year 1929 were devoted to the propagation of the more important fresh water and anadromous food and game fishes, including Atlantic and landlocked salmon, speckled, brown, Loch Leven and rainbow trout in the Maritime Provinces, whitefish, pickerel, cutthroat, rainbow, brown and Loch Leven trout in the Prairie Provinces, and Pacific salmon (principally sockeye), cutthroat, Kamloops, rainbow and speckled trout in British Columbia.

Facilities for retaining and feeding fry so as to afford a longer season for distribution were enlarged at several establishments where such development was

feasible. The total distribution for 1929 was over twenty-one per cent larger than it was in 1928, and almost twice as large as the distribution for 1927. The distribution for these years was:—

1927.....	295,283,782
1928.....	470,302,380
1929.....	570,771,626

Increases over 1928 in numbers distributed were made in rainbow, cut-throat, speckled and Kamloops trout, sockeye and spring salmon and whitefish. The bulk of the increase was in whitefish fry, distributed in the Prairie Provinces, which was increased from 129,183,026 in 1928 to 216,755,000 in 1929.

In addition to the distributions that were made from the hatcheries, twenty-eight lakes and streams received allotments of fingerlings and older fish by transfer from other bodies of water. This work was very largely confined to the Prairie Provinces where there are many districts which are not readily accessible to existing hatcheries, and which have many bodies of water of indifferent quality, in which the better class of fishes, such as are handled in our hatcheries, are not likely to live and thrive. This work involved the capture and transfer, in many instances for considerable distances, of 18,274 fish.

Examinations and inspections were continued with a view to locating waters where fish eggs might be obtained in sufficient quantities for hatchery purposes, and with a view to locating sites where the fish cultural service might be extended advantageously by the construction of new establishments in districts that are not readily accessible from existing hatcheries. As opportunity offered, the general inspection of waters throughout the country was continued by officers and employees of the fish cultural and fisheries services.

Various experiments and investigations with equipment, methods, etc., and in feeding fry and older fish different kinds of food and different combinations were conducted at several hatcheries.

Considerable progress was made in investigation of various problems relating to fish culture by the Biological Board and its sub-committees. A series of lectures under the direction of Dr. W. A. Clemens, Director of the Nanaimo Biological Station, were given to superintendents of hatcheries in British Columbia in July, 1929. The lectures were given at the University of British Columbia, which also generously supplied necessary laboratory material and equipment.

The fish cultural branch also participated with assortments of hatchery product in several exhibits for portraying natural resources. These exhibits were of considerable educational value and aroused great interest.

Gratifying reports regarding the results that are apparent from the distribution of hatchery products continued to accumulate from all districts where fish cultural operations are carried on. In many districts, local organizations, such as boards of trade, angling and protective associations, service clubs, as well as private individuals, have provided transportation and otherwise assisted in distribution work. In a few instances the necessary facilities were provided and allotments of eggs and fry that were made by the department were hatched or retained and fed for several months at the expense of the local organization but under the general supervision of the nearest fish cultural officer.

The Canadian National Railway, Canadian Pacific Railway, Dominion Atlantic Railway, Kettle Valley Railway and the Esquimalt and Nanaimo Railway Companies continued their generous assistance and co-operation by

furnishing free transportation for shipments of game fish and game fish eggs with their attendants. The extent of this co-operation is indicated in the following summary:—

Railways	Total mileage on trip passes	Number of passages	Mileage baggage car permit			Number cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	21,105	181	11,144	10,201	21,345	882	873	1,755	164
C.P.R.....	18,017	100	10,041	9,831	19,872	479	480	959	119
D.A.R.....	412	4	206	206	412	12	17	29	4
K.V.R.....	771	6	546	250	796	9	6	15	7
E. & N.R.....	363	5	212	212	424	17	17	34	6
	40,668	296	22,149	20,700	42,849	1,399	1,393	2,792	300

NOTE.—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one-way passage for cases or cans, either by permit, special authority or free transportation without a permit form.

Thirty main hatcheries, ten subsidiary hatcheries, five salmon retaining ponds and several egg-collecting stations were in operation during the calendar year 1929. The output from these was 570,287,381, as shown by species in the following statement.

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING THE SEASON 1923

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings	Yearlings and older fish	Total distribution by species	Total dis- tribution by hatcheries
1928	Antigonish.....	Antigonish Co., N.S.....	Atlantic salmon.....	.....	.....	.....	550,000	485,780	.....	1,085,780	2,089,835
1876	Bedford.....	Halifax Co., N.S.....	Speckled trout.....	.....	.....	.....	.....	1,054,055	.....	1,054,055	.....
1902	Margaree.....	.....	Atlantic salmon.....	(b) 1,350	200	.....	.....	1,159,950	.....	1,161,500	2,538,730
1912	(a) Lindlof.....	Inverness Co., N.S.....	Speckled trout.....	.....	.....	230	910,000	1,377,000	.....	1,377,230	.....
1913	Middleton.....	Richmond Co., N.S.....	Atlantic salmon.....	.....	.....	.....	.....	1,045,000	.....	1,045,000	.....
1906	Windsor.....	Annapolis Co., N.S.....	Atlantic salmon.....	.....	.....	297,600	.....	189,822	.....	189,822	2,144,822
1928	Yarmouth.....	Hants Co., N.S.....	Speckled trout.....	.....	.....	.....	.....	1,007,000	.....	1,007,000	297,600
.....	.....	Yarmouth Co., N.S.....	No distribution.....	.....	.....	.....	.....	1,367,530	.....	1,367,530	2,374,530
1928	Florenceville.....	.....	Atlantic salmon.....	.....	.....	.....	.....	1,139,975	.....	1,139,975	.....
.....	.....	.....	Speckled trout.....	.....	.....	25,000	30,000	1,422,475	.....	1,477,475	2,017,450
1880	Grand Falls.....	Carleton Co., N.B.....	Atlantic salmon.....	.....	.....	.....	.....	1,516,624	.....	1,516,624	.....
.....	.....	.....	Speckled trout.....	.....	.....	.....	15,000	723,865	1,316	740,002	2,256,025
1915	(a) Tobique.....	Victoria Co., N.B.....	Atlantic salmon.....	.....	.....	.....	.....	2,026,287	.....	2,026,287	.....
1914	Saint John.....	Victoria Co., N.B.....	Atlantic salmon.....	.....	.....	488,000	107,500	690,073	.....	797,574	2,823,861
.....	.....	St. John Co., N.B.....	Brown trout.....	.....	.....	.....	.....	150,000	.....	488,000	488,000
.....	.....	.....	Landlocked salmon.....	.....	.....	.....	.....	283,866	.....	433,866	.....
.....	.....	.....	Loch Leven trout.....	.....	.....	.....	.....	101,423	911	101,423	.....
.....	.....	.....	Rainbow trout.....	.....	300	.....	.....	100,512	.....	94,713	.....
.....	.....	.....	.....	.....	.....	.....	25,000	15,386	.....	40,398	.....
1874	Miramichi.....	Northumberland Co., N.B.....	Speckled trout.....	.....	.....	.....	20,000	647,300	.....	668,275	1,338,993
1874	Restigouche.....	.....	Atlantic salmon.....	.....	.....	.....	.....	4,175,089	.....	4,175,089	.....
.....	.....	.....	Speckled trout.....	.....	.....	.....	.....	96,474	.....	96,474	4,271,563
1914	(a) Nipisiquit.....	Restigouche Co., N.B.....	Atlantic salmon.....	.....	.....	1,380,308	.....	97,546	.....	1,477,854	1,634,579
1906	Kelly's Pond.....	Gloucester Co., N.B.....	Speckled trout.....	.....	.....	380,284	.....	.....	.....	156,725	.....
.....	.....	Queen's Co., P.E.I.....	Atlantic salmon.....	.....	.....	.....	88,000	380,284	.....	380,284	380,284
.....	.....	.....	Rainbow trout.....	.....	.....	124,560	.....	.....	.....	308,127	.....
1914	Gull Harbour.....	Big Island, Lake Winnipeg, Man.....	Speckled trout.....	.....	.....	.....	.....	95,567	.....	25,372	.....
.....	.....	.....	Pickeral.....	.....	.....	.....	73,600	608,754	.....	682,354	1,015,853
1928	Swan Creek.....	Swan creek, Lake Manitoba, Man.....	Whitefish.....	(b) 1,800,000	170,000	5,225,000	.....	.....	.....	5,395,000	79,895,000
1909	Winnipegosis.....	Snake Island, Lake Winnipegosis, Man.....	Pickeral.....	83,980,000	.....	72,700,000	.....	.....	.....	74,500,000	139,980,000
.....	.....	.....	Salmon trout.....	.....	.....	56,000,000	.....	.....	.....	139,980,000	.....
1929	(c) Cochin.....	McIntosh Creek, Sask.....	Whitefish.....	24,055,000	.....	66,500,000	.....	109,500	.....	109,500	66,609,500
.....	.....	.....	Pickeral.....	(b) 42,325,000	.....	.....	.....	.....	.....	24,055,000	.....
1915	Fort Qu'Appelle.....	Fort Qu'Appelle, Sask.....	Whitefish.....	.....	.....	.....	.....	133,714	.....	133,714	66,380,000
.....	.....	.....	Loch Leven trout.....	.....	.....	30,002,500	.....	.....	.....	30,002,500	.....
.....	.....	.....	Pickeral.....	.....	.....	.....	.....	91,228	.....	91,228	.....
.....	.....	.....	Salmon trout.....	.....	.....	.....	.....	.....	.....	18,395,000	48,622,442
1914	Banff.....	Banff, Alta.....	Whitefish.....	.....	.....	18,395,000	.....	.....	.....	18,395,000	.....
.....	.....	.....	Brown trout.....	.....	.....	.....	.....	43,800	.....	43,800	.....
.....	.....	.....	Cutthroat trout.....	.....	240,000	135,000	520,000	147,000	.....	1,042,000	.....
.....	.....	.....	Loch Leven trout.....	.....	.....	.....	95,000	237,000	.....	332,000	.....
.....	.....	.....	Pickeral.....	.....	.....	670,000	.....	.....	.....	670,000	.....
.....	.....	.....	Rainbow trout.....	.....	.....	226,000	155,000	.....	.....	591,000	.....
.....	.....	.....	Salmon trout.....	.....	.....	.....	49,000	210,000	.....	49,000	2,727,800

1917	(a) Spray lakes.....	Spray Lakes, Alta.....	Cutthroat trout.....	60	332,860	332,920	322,920
1928	(a) Jasper Park.....	Jasper Park, Alta.....	Rainbow trout.....	45,387	15,387	45,387	208,786
1927	Lesser Slave Lake.....	Lesser Slave Lake, Alta.....	Speckled trout.....	19,150,000	208,786	19,150,000	254,173
1928	Waterton Lakes.....	Waterton Lakes Park, Alta.....	Whitefish.....	10,355,000	10,355,000	10,355,000	29,505,000
1916	Cultus Lake.....	Waterton Lakes Park, Alta.....	Cutthroat trout.....	591,735	270,500	871,265	573,450
1915	Harrison Lake.....	Cultus Lake, B.C.....	Rainbow trout.....	3,000	249,450	274,000	1,444,715
1922	Lloyds creek.....	Harrison Lake, B.C.....	Steelhead salmon.....	4,042,660	3,000	78,652	4,123,712
1906	Pemberton.....	Lloyds Creek, Kamloops district, B.C.....	Kamloops trout.....	19,386,000	4,814,000	24,200,000	24,200,000
1917	Pitt Lake.....	Birkenhead river, B.C.....	Kamloops trout.....	723,000	275,100	1,130,100	1,130,100
1908	Stuart Lake.....	Pitt Lake, B.C.....	Kamloops trout.....	23,000	28,400	53,400	21,650,000
		Stuart Lake, B.C.....	Sockeye salmon.....	360,000	21,350,000	21,650,000	21,703,400
			(audiocted).....	(b) 10,250	4,945,143	174,045	5,119,188
			Sockeye salmon.....	(b) 3,900	3,200,000	14,150	3,214,150
1929	(c) Squilax Camp.....	Adams River, Shuswap District, B.C.....	Sockeye salmon.....	(b) 505,000	3,200,000	505,000	505,000
1903	Lakelse Lake.....	Lakelse Lake, B.C.....	Kamloops trout.....	125,000	4,069,300	125,000	5,223,100
1908	Rabine Lake.....	Rabine Lake, B.C.....	Sockeye salmon.....	(b) 408,000	5,662,000	745,800	5,348,100
1906	Rivers Inlet.....	Owliceno Lake, B.C.....	Sockeye salmon.....	(b) 5,176,000	3,278,881	1,192,621	7,751,821
1911	Anderson Lake.....	Anderson Lake, Vancouver Island, B.C.....	Sockeye salmon.....	(c) 3,509,000	210,244	8,679,046	13,855,046
1911	Cowichan Lake.....	Cowichan Lake, Vancouver Island, B.C.....	Cutthroat trout.....	275,000	1,041,410	2,080	8,787,881
			Speckled trout.....	35,000	62,892	218,870	212,324
			Spring salmon.....	137,000	50,000	2,373,159	126,250
1911	Kennedy Lake.....	Kennedy Lake, Vancouver Island, B.C.....	Steelhead salmon.....	33,000	446,913	1,535,280	1,535,280
1914	Gerrard.....	Trot Lake, Kootenay District, B.C.....	Sockeye salmon.....	39,413,285	338,551,212	87,892	2,560,159
1923	Nelson.....	Nelson, B.C.....	Kamloops trout.....	337,500	141,715	446,913	446,913
			Kamloops trout.....	(b) 264,000	145,674	479,215	264,000
			Kennedy's salmon.....	314,915	247,407	460,589	392,407
			Rainbow trout.....	145,000	30,778	392,407	1,506,211
1928	(a) Penask Lake.....	Nicola Valley, B.C.....	Speckled trout.....	688,000	340,850	718,778	718,778
1928	(a) Summerland.....	Okanagan Lake district, B.C.....	Kamloops trout.....	110,000	17,350	450,850	107,350
			Speckled trout.....	90,000	4,680,000	4,680,000	5,238,200
			Whitefish.....	152,796,350	3,461,763	36,061,539	570,287,381
				39,413,285	338,551,212	3,232	570,287,381

(a) Subsidiary hatchery.

(b) All of these were planted from the 1929 Fall collection.

(c) Collecting camp.

(d) 240,000 of these planted from the 1929 fall collection.

(e) 2,506,000 of these planted from the 1929 Fall collection.

(f) This distribution represents output 1929 resulting from autumn spawners of 1928 and from spring spawners of 1929.

In addition to the above, 434,245 Cutthroat trout eyed eggs were purchased from S. S. Drew, Esq., Troy, Montana, and planted direct, as follows. —

Fraser River watershed —	25,000
Sumas river.....	25,000
Kanaka creek.....	434,245
Nicomekl river.....	484,245

The following statement shows the output of different kinds distributed in the several provinces in which fish cultural operations are conducted by the federal Government:—

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH
DURING 1929

Nova Scotia—		
Atlantic salmon.....	6,596,855	
Speckled trout.....	5,466,112	
		12,062,967
New Brunswick		
Atlantic salmon.....	10,498,004	
Brown trout.....	101,423	
Landlocked salmon.....	94,713	
Loch Leven trout.....	40,398	
Rainbow trout.....	318	
Speckled trout.....	2,459,050	
		13,193,906
Prince Edward Island		
Atlantic salmon.....	308,127	
Rainbow trout.....	25,372	
Speckled trout.....	682,354	
		1,015,853
Manitoba—		
Pickrel.....	145,375,000	
Salmon trout.....	109,500	
Whitefish.....	141,000,000	
		286,484,500
Saskatchewan—		
Loch Leven trout.....	133,714	
Pickrel.....	54,057,500	
Salmon trout.....	91,228	
Whitefish.....	60,720,000	
		115,002,442
Alberta—		
Brown trout.....	43,800	
Cutthroat trout.....	2,236,185	
Loch Leven trout.....	332,000	
Pickrel.....	19,820,000	
Rainbow trout.....	1,209,837	
Salmon trout.....	49,000	
Speckled trout.....	208,786	
Whitefish.....	10,355,000	
		34,254,608
British Columbia—		
Cutthroat trout.....	212,324	
Kamloops trout.....	3,404,256	
Kennerly's salmon.....	264,000	
Rainbow trout.....	460,589	
Sockeye salmon.....	96,914,105	
Speckled trout.....	626,007	
Spring salmon.....	1,535,280	
Steelhead salmon.....	176,544	
Whitefish.....	4,680,000	
		108,273,105
		(a) 570,287,381

(a) This distribution represents output 1929 resulting from autumn spawners of 1928 and from spring spawners of 1929.

In addition to the above 484,245 cutthroat trout eyed eggs were purchased from S. S. Drew, Troy, Montana, and planted direct as follows:—

Fraser River watershed—	
Sumas river.....	25,000
Kanaka creek.....	25,000
Nicomekl river.....	434,245

Full particulars regarding the extent and scope of this service appear in the Annual Report on Fish Culture for 1929, which appears as Appendix No. 3 herewith. Copies of the report on fish culture may be obtained on application to the Fisheries Branch.

FISH COLLECTION SERVICE

The Fish Collection Service, which has been in operation on sections of the Atlantic coast for three seasons, carrying the fishermen's catches to central marketing points, has proved its usefulness and expansion has been found necessary from year to year. Its operation enables the fishermen to get cash for their catches. They are saved the time, work, and expense which would be involved in curing their fish, and thus they are able to spend more time in actual fishing, with consequent increase in their earnings.

During the 1929 season the service was carried on along six stretches of coast and twenty boats, in all, were employed in the collection work, though not all continuously or at the same time. The total quantity of fish carried was 8,623,215 pounds, or some 3,300,000 pounds more than in 1928, and the total cost was slightly over \$83,000 or less than one cent per pound. The fish are transported at a cost to the shippers of ten cents per hundred pounds but the collecting boats are required to carry supplies of bait and ice free of charge and to return the empty shipping boxes without charge to the fishermen. The quantity of fish carried on the several routes in 1929 was as follows: Ecum Secum-Halifax, 846,970 pounds; Westport-Digby, 2,799,269 pounds; Main-à-Dieu to Canso, 1,565,271 pounds; Port Beckerton-Canso, 3,056,967 pounds; Port Latour-Lockeport, 141,054 pounds; Port Hood-Hawkesbury, 213,784 pounds. Cod and haddock made up by far the great part of the total quantity of fish carried. Nearly 4,568,000 pounds of cod were collected and slightly more than 2,800,000 pounds of haddock.

The regular commercial boat services are of practically no use in the transportation of fresh fish since they are not equipped with the facilities necessary for handling fish in this form and their schedules do not provide for trips in sufficient frequency; moreover, in numbers of cases, the draft requirements of the vessels are too great to permit them to enter the fishing ports. Hence, if the fishing industry is to be given a fair chance to develop, it must be afforded reasonably adequate transportation facilities of another kind for the marketing of the fresh fish that is taken, and it is these facilities which the Fish Collection Service is designed to supply.

That the service has proved a remarkable incentive to the development of the industry is evidenced by the fact that in the winter of 1928 over twenty new fishing boats were built in the districts it covered, and during the present winter eighty-seven motor boats were added to the fishing fleet and other preparations for the expansion of operations were made in the way of building piers, storing increased quantities of ice, etc. In some instances plans for hand-trawling in place of hand-lining were being made.

At the same time, the lack of boats that were wholly suitable for the collection work has prevented the service from being as efficient as it should have been. This condition as to available boats has also made it necessary to employ a larger number of carriers than would otherwise have been needed and has added to the cost of operations. Experience has shown that the type of boats needed should have high speed, large carrying capacity, chilled holds, good sea-going qualities, and, at the same time, shallow draft so that entry into the smaller harbours may be possible. With these facts in mind, it was decided, last autumn, to call for tenders for supplying five boats of this type on a subsidy basis. The lowest tender was accepted, as it was considered reasonable. Boats which fully meet all the requirements indicated above are to be provided under the contract at \$1,975 per month, gross, and the entire expense of operating them satisfactorily is to be borne by the owners. The term of the subsidy is for at least five months of each year for a period of five years.

As the present fiscal year draws to a close it seems doubtful if it will be feasible during the coming season to operate the service to the extent expected

since, on account of the steam trawler regulations, the companies which have previously been buying most of the fish in the collecting areas have quite recently intimated that they will not be prepared to do so in the 1930 season. This information is causing a measure of consternation among the fishermen in these areas, since, as already explained, they had made arrangements for fishing more intensively during the coming season than in the past; nevertheless, they feel that the trawler regulations are in their permanent interest and should be maintained. At this late date it will not be possible for new arrangements to be made, on those portions of the coast under consideration, for handling fish for the fresh fish markets in the earlier part of the season but it is anticipated that the service will be necessary in the later months. Having properly-adapted boats available will probably also make it possible to open up new channels to the fishermen of the more easterly portion of the coast for marketing their lobsters, and certain other products, more profitably than they have been able to do in the past. Even as regards the approaching season, which, there seems little doubt, will prove the transition period, there is no indication that the boats will not be needed, and there is nothing to suggest that they will not be required throughout the full term covered by the contract.

FISHERIES INTELLIGENCE SERVICE

Distribution of weather, bait, and ice reports by radio, which was begun by the Fisheries Branch several years ago, has been proving increasingly useful to the men engaged in the Atlantic fisheries. Most of the vessels employed in the fisheries are now equipped with wireless receiving sets and as the broadcasts cover all the important fishing grounds, including the Grand Banks, this radio service is of very material benefit to the fishermen. During the year under review the weather reports were broadcast twice daily from St. John, Halifax, and Louisburg. Reports as to bait and ice conditions, collected by telegraph and telephone from fisheries officers along the coast and compiled at the Halifax office, were broadcast twice a day from Halifax and Louisburg during the period from April onward. The broadcast was also repeated on the banks from C.G.S. *Arras*. The reports covered conditions at some twenty different points, and through an arrangement made with the Newfoundland Department of Marine and Fisheries it was possible to add to them useful information as to bait supplies and the apparent abundance or scarcity of fish in several Newfoundland areas. From time to time items of current news were also included in the broadcasts from Halifax and Louisburg, as well as emergent messages to men on the fishing vessels.

In November the publication of a monthly Fisheries News Bulletin was begun by the Fisheries Intelligence and Publicity Division. The bulletin is designed to spread information as to Canada's fisheries resources and fishing industry and the national importance of the fisheries enterprises. It is printed both in English and French editions and is distributed to newspapers, fishermen's organizations, individual fishermen, various persons in the fishing trade, and among the public generally. In the course of the year arrangements were also made, with the co-operation of the Commercial Intelligence Service of the Department of Trade and Commerce, whereby cable reports as to market conditions touching dried and pickled fish in certain important export markets are obtained monthly and distributed from Ottawa in summarized form to persons interested in the production of dried and pickled fish in Canada. The cable reports are made by the Canadian Government Trade Commissioners at Havana, Cuba; Kingston, Jamaica; Port of Spain, Trinidad; Rio de Janeiro, Brazil; and Milan, Italy, respectively. Through the courtesy of the Royal Bank of Canada cable reports are also supplied by the bank's branch at San Juan,

Porto Rico. Several pamphlets relating to the fisheries were prepared and issued during the year by the Publicity Division, which also deals with requests for general information as to the fisheries.

Collection of statistics of all fisheries which are under federal control is an important part of the work of the Fisheries Intelligence and Publicity Division. The statistics are collected by fishery officers and are checked at Ottawa. Sea fishery statistics are collected monthly and are published in detail every three months in the Quarterly Bulletin of Sea Fishery Statistics. A system for the monthly collection of statistics of the fisheries in the Prairie Provinces has also been recently brought into effect by the Fisheries Branch. The figures for the annual fisheries statistical report, which is published by the Dominion Bureau of Statistics, are collected by the Fisheries Branch, for the most part, so far as the fisheries administered by the Dominion are concerned, and the work of preparing them for publication is done by the bureau and the branch jointly.

SCALLOP INVESTIGATIONS

Scallop investigations in Maritime Province waters were continued during the year. Two boats were specially assigned to this work. The *Madeline A*, Captain Walter F. Doucette, with Mr. H. S. LeBlanc as Observer, was in service along the shore of Nova Scotia from Cape Negro island, West channel, in Shelburne county, to Conrad's cove, in Lunenburg county. The *Alberton*, with Mr. Seymour A. Young as Captain and Observer, operated in six different areas off the coast of Prince Edward Island.

The scallop areas which were revealed by the work of the *Madeline A* as apparently most promising were found offshore from Cape Negro harbour well up to the entrance of Port Clyde and at Port LeHebert. At Port Medway, scallops of good size were found but they were scattered over a considerable area. At the other places where draggings were made, results did not indicate the presence of scallops in commercial quantities. All told, three hundred and sixty-eight draggings were carried out by the *Madeline A*.

The investigations made by the *Alberton* were in the Charlottetown Harbour area, the Georgetown area, the Alberton and Malpeque area, the South Point or Wood Island area, the Miminegash area and the Murray Harbour area. Charlottetown harbour was found to possess fair sized scallops in some abundance but the small area of the sea-bed indicated that commercial fishing could not be carried on continuously over any extended period of years. Investigation in the Georgetown area showed scallops apparently present in sufficient quantities to enable commercial fishing to be carried on fairly profitably. The Alberton area, as a whole, is a most promising scallop ground and draggings which were made brought out indications of rapid replenishment of depletions made by previous commercial fishing.

The South Point, Miminegash and Murray Harbour areas abounded in scallops some years ago, but, since 1927, for some reason that has not been established, a great many of the scallops have died. In these three areas, however, Captain Young found indications of numerous young scallops and, as the areas are quite large and the sea-bed is well suited to scallop development, the observer was of the opinion that the prospect of a speedy replenishment of these fields was encouraging.

Further account of the scallop investigations will be found in Appendix No. 5.

OYSTER INVESTIGATIONS IN PRINCE EDWARD ISLAND

Commencing on June 15, further investigation in connection with the oyster resources of Prince Edward Island was carried on by Mr. A. W. H.

Needler, of the staff of the Biological Board. The investigation was centred in the Bideford river area, part of the Malpeque bay region, which was formerly the most productive section of the Canadian oyster industry. Some 750 bushels of clean shells were placed in the river in galvanized wire baskets. Observations of the temperatures were made and the oysters themselves were kept under observation. Spawning was found to take place at the head of Bideford river about July 15 when the temperature was approximately 20 to 22° C. Spat was first observed in the shells on August 7 and continued to appear until about August 20, after which none was observed in the early fixed stages. Larvae were not taken but the observations suggested that from two to three weeks is the approximate time occupied in the free larval stage. It was found that spat appeared on the clean shells everywhere in the upper two miles in the river and that the concentration was greatest from one to two feet below ordinary tide. A cultch consisting of 500 bushels of mussel shells which had been ashore two years, and 250 bushels of oyster shells which had been ashore for two weeks, was put out. It was found that very little difference existed between sets on the mussel shells and sets on the oyster shells. In the case of the latter, however, even the innermost shells showed a good set while in the case of the sets on the mussel shells the spat did not penetrate to the same extent. Regular temperatures and water samples were taken throughout the season and data were collected at Percival river, at East river (Charlottetown), and at Savage harbour. The data obtained showed that the water reached a temperature about 70° F. everywhere in the areas examined, and at the heads of the creeks in Bideford river went as high as 85° F. Observations were made on the presence of starfish and the distribution of oysters of various size in different areas and a start was made at taking plankton samples. With a view to future observation two small beds were cleaned and planted with 60 barrels of large oysters. About half of the spat obtained during the summer was also planted thickly on clean beds. The investigations are outlined in more detail in Appendix No. 6.

ORGANIZATION OF FISHERMEN

Acting in accordance with the recommendations of the Royal Commission on the Fisheries of the Maritime Provinces and the Magdalen Islands, the department took action during the year to assist the fishermen of these territories in formulating plans of organization and carrying them out. Dealing with this subject the Royal Commission had recommended "that the establishment of co-operative organizations of fishermen be assisted by the department as soon as possible, and that an organizer, experienced in co-operative methods, be appointed and paid by the federal Government for the required period to initiate and complete this work." It was obviously of the utmost importance that every care be taken in selecting a soundly-equipped person to undertake this work of organization. The field of selection was carefully examined and in September, 1929, Rev. Dr. M. M. Coady, of the Faculty of the University of St. Francis Xavier, Antigonish, N.S., was appointed by the Civil Service Commission as Promoter of Fishermen's Organization. Dr. Coady had devoted much time to an examination of the rural problem in the Maritime Provinces, especially in Nova Scotia, and, in addition, he had studied at first hand the co-operative movement among the farmers of Western Canada and parts of the United States. He began his work as Promoter of Fishermen's Organization immediately upon his appointment in September and has continued it throughout the remainder of the fiscal year. He has visited fishing communities in all parts of the Maritime Provinces, and in most of them local fishermen's associations have been formed. At the present time there are more than 100 such associations in the three provinces, the great majority of them established directly as a result of the depart-

ment's work through Dr. Coady. It is the intention that Dr. Coady should continue in his position until the fishermen in remaining parts of the Maritime Provinces and in the Magdalen Islands have been organized, and it is expected that this will have been accomplished by early summer. It is proposed that a convention of delegates from the various local associations will then be held at some central point. At this convention the delegates will have opportunity to decide what form of federation of the associations should be adopted and to determine the policy to be followed by any united body that may be established.

MEETINGS OF FISHERIES OFFICERS

In the course of the fiscal year meetings of fisheries officers were held both on the Pacific coast and the Atlantic coast. The British Columbia officers met at Vancouver and the sea fisheries officers of the Maritime Provinces and the Magdalen Islands at Halifax. In each case the sessions continued for two days. At Vancouver the Chief Supervisor of Fisheries for British Columbia presided and at Halifax the Director of Fisheries Promotion and Inspection. It is the policy of the department to have meetings of this kind held annually.

At the Atlantic coast conference the agenda included the presentation of papers by various officers and general discussions of points in connection with fisheries administrative work which the papers brought forward or suggested. The subjects thus taken up included the effective utilization of fisheries officers in educational and demonstrational work, the enforcement of the provisions of the Fish Inspection Act, the prevention of illegal fishing whether in tidal or non-tidal waters, the application of the Knight plan for inspecting and grading lobster factories, the collection of fisheries statistics, the most efficient division of officers' time between office and field work, and the advisability of giving to each lobster cannery a permanent licence number and having this number stamped on all cans of lobster intended for exportation. In addition to the questions raised in the officers' papers or brought up in the discussions, various points were put before the conference by representatives of several branches of the fishing industry, who had been asked to read papers, and by spokesmen for fish and game associations who were present by invitation. The agenda also included an address by the Promoter of Fishermen's Organization, who discussed the benefits which might be expected to follow from the formation of fishermen's associations. Resolutions referring to various fisheries and administrative questions were drawn up by the officers and approved by them at a sitting which they held during the conference, and those of the resolutions which called for departmental action have since been taken under consideration.

At British Columbia conference separate district assemblies were first held, when the officers of each of the three fisheries districts of the province met with the Chief Supervisor and discussed district matters. At the subsequent meeting of all the officers a large number of questions of general importance were considered. The subjects taken up included such questions as the weekly closed season, suggested changes in the regulations, patrol methods, examination of spawning areas, pollution of streams, capture of immature salmon, statistics, method of issuing licences, injury done by predaceous birds, seizure of illegal equipment, etc. Memoranda covering the discussion of the principal points brought up were made for departmental purposes by the Chief Supervisor.

FISHING BOUNTY

Payments of fishing bounties during the year amounted in all to \$159,749.35, which was allotted as follows: to 546 vessels and their crews, \$40,282; to 9,000 boats and their crews \$119,467.35. Fishing bounties are paid from the sum of \$160,000 which is appropriated annually by the Governor in Council under the authority of "An Act to Encourage the Development of the Sea Fisheries

and Building of Fishing Vessels." The distribution is among fishermen and fishing vessels and boat-owners on the Atlantic coast under regulations made from time to time by the Governor in Council.

The basis of distribution for the year 1929 was as follows:—

To owners of vessels entitled to receive bounty, \$1 per registered ton, payment to the owner of any one vessel not to exceed \$80.

To vessel fishermen entitled to receive bounty, \$7.50 each.

To owners of boats measuring not less than 12-foot keel, \$1 per boat.

To boat fishermen entitled to receive bounty, \$6.65 each.

There were 9,546 bounty claims paid. In the preceding year 9,390 claims were paid.

The following statement shows the 1929 expenditures in detail:—

1929-30

Province and County	Boats	Men	Amount	Vessels	Tons	Average tons	Men	Amount	Total Amount
<i>Nova Scotia—</i>									
Annapolis.....	159	283	2,040 95				1	7 50	2,048 45
Antigonish.....	120	184	1,343 60						1,343 60
Cape Breton.....	286	545	3,910 25	30	581	19	121	1,488 50	5,398 75
Cumberland.....	3	4	29 60						29 60
Digby.....	327	573	4,137 45						4,137 45
Guysboro.....	540	956	6,237 40	30	594	20	149	1,711 50	7,948 90
Halifax.....	896	1,203	8,895 95	62	1,102	18	214	2,707 00	11,602 95
Inverness.....	244	517	3,682 05	6	124	21	26	319 00	4,001 05
Kings.....	34	57	413 05						413 05
Lunenburg.....	417	555	4,107 75	125	6,792	56	1,635	19,054 50	23,162 25
Pictou.....	18	28	204 20						204 20
Queens.....	127	226	1,629 90	8	162	20	35	424 50	2,054 40
Richmond.....	358	670	4,574 10	7	167	24	25	354 50	4,928 60
Shelburne.....	463	884	6,341 60	25	714	29	184	2,094 00	8,435 60
Victoria.....	281	461	3,346 65	13	243	19	44	573 00	3,919 65
Yarmouth.....	131	309	2,185 85	8	542	68	147	1,644 50	3,830 35
Total.....	4,404	7,455	53,080 35	314	11,021	35	2,581	30,378 50	83,458 85
<i>New Brunswick—</i>									
Charlotte.....	224	390	2,817 50	2	138	69	11	220 50	3,038 00
Gloucester.....	344	936	6,567 90	193	1,646	9	866	8,141 00	14,708 90
Kent.....	91	178	1,274 70	5	82	16	13	179 50	1,454 20
Northumberland.....	12	30	211 50	16	299	19	34	554 00	765 50
Restigouche.....	2	4	28 60	1	10	10	4	40 00	68 60
Saint John.....	23	38	275 70						275 70
Total.....	696	1,576	11,175 90	217	2,175	10	928	9,135 00	20,310 90
<i>Prince Edward Island—</i>									
Kings.....	60	106	764 90						764 90
Prince.....	550	1,053	7,552 45	7	190	27	17	317 50	7,869 95
Queens.....	135	297	2,110 05						2,110 05
Total.....	745	1,456	10,427 40	7	190	27	17	317 50	10,744 90
<i>Quebec—</i>									
Bonaventure.....	516	980	7,026 35	3	63	21	13	160 50	7,186 85
Gaspe.....	2,061	4,185	29,924 50	5	148	30	19	290 50	30,215 00
Matane.....	69	110	800 50						800 50
Saguenay.....	509	987	7,032 35						7,032 35
Total.....	3,155	6,262	44,783 70	8	211	26	32	451 00	45,234 70
Grand total.....	9,000	16,749	119,467 35	546	13,597	25	3,558	40,282 00	159,749 35

PACIFIC COAST SALMON TAGGING

In the course of the past five years an extensive salmon tagging program has been carried on in British Columbia waters, under the auspices of the Biological Board of Canada, with a view to obtaining accurate information as to the migration routes of the several species of Pacific salmon, and, as a result, there is being built up a body of material very valuable from the administrative and scientific points of view and of a great deal of general interest. A continuation of tagging programs has been planned. A summary of the results of operations so far is included in Appendix No. 2, and persons interested in the fisheries will find its perusal well worth while. In reading the summary, however, it should be kept in mind that the information touching 1929 tagging operations should not be regarded as complete. Additional recaptures of tagged salmon during 1930 may be expected to alter the figures somewhat.

Another important investigation which is being carried on in British Columbia under Biological Board auspices is that which has been in progress at Cultus lake since 1925 with a view to determining whether artificial propagation of sockeye by means of hatcheries is more efficient than natural propagation, and, if so, to what degree. Investigation is also being directed toward ascertaining the degree of mortality during the salt water period of the sockeye's life, but this phase of the inquiry is as yet in the experimental stage only.

The chief advantage claimed for artificial propagation is that it curtails or avoids certain losses which occur in natural propagation, and, so far, the Cultus investigation has indicated that the artificial method of propagation has been four times as efficient as the natural method. It must be distinctly emphasized, however, that the inquiry is far from completed and positive conclusions are not safely to be drawn from the results so far observed. Further research may establish facts materially different from those which have seemingly been indicated up to the present.

Stated in broad, general outline, the operations followed in the investigation consist, firstly, of counting all the sockeye entering the counting weir at the lake each year and, secondly, counting the young resulting from each spawning as they make their way seaward, either as fry, yearling or two year olds. In this way the comparisons are being made as between the results of natural propagation and the results of artificial methods. Since two methods of artificial propagation are followed, the comparisons cover cycles of three years and the program mapped out for the investigation calls for its continuance for four complete cycles. It is believed that at the end of the cycles—in other words, twelve years—the results will show clearly the relative merits of the several methods of propagation and will also indicate the applicability of artificial methods to certain concrete situations which may be found in the maintenance and development of the sockeye fishery.

In 1925 and in 1927 natural propagation was followed in the investigation, and artificial propagation in 1926, 1928, and 1929. In the years of natural propagation all sockeye are counted and then allowed to continue their way to the spawning grounds. The number of female fish being known, and the average number of eggs carried by each, an estimate of the total number of eggs contained in the fish can be made. In turn, the number of down-stream migrants resulting from each natural spawning is ascertained through an actual count of all salmon passing from the lake. The success of this method of propagation is therefore determined in total number of migrants and in percentage of the total number of eggs deposited.

In artificial propagation the investigation has employed two of the standard methods—one, development of the eggs to the "cyed" stage and planting them in the gravel of the spawning bed and, in the other case, the development of the "free-swimming fry" stage and subsequent liberation in the lake. Whichever

method is followed, all the sockeye are retained below the lake and spawned, and the eggs are removed to the hatchery. An estimate is made up as to the egg losses caused by incomplete stripping or by females dying before they had spawned; and the losses occurring in the hatchery are recorded up to the time of the removal of the "eyed" eggs, in the one instance, and the liberation of the "free swimming" fry, in the other instance. Down-stream migrants resulting from each year of artificial propagation are counted, as in the cases in which natural propagation has been employed, and the percentage they represent of the total number of eggs collected is determined.

In 1925, when natural propagation was the method followed, 3,883 female sockeye were counted, when bound to the spawning grounds, and 1,540 males. The total number of eggs contained in the female fish was 17,473,500. There were 197,562 migrants from the 1925 spawning, a number equal to 1.13 per cent of the egg total. In the following year 1,949 female sockeye entered the counting weir and 3,122 males. The females contained 8,770,500 eggs and the total collection of eggs was 6,487,000. Subsequent observation showed that there were 347,229 migrants from this spawning, which was equal to approximately 3.96 per cent of the number of eggs contained in the spawned fish.

NORTH AMERICAN COMMITTEE ON FISHERY INVESTIGATIONS

The very important matter of the relation of the temperature of the water to the fisheries is among the subjects which have been engaging the attention of the North American Committee on Fishery Investigations, a body which co-ordinates investigations of common interest to the countries represented on it, viz., United States, Canada, Newfoundland, and France. Efforts are being made to obtain daily records of the temperature of the water along at least the most important fishing sections of the Atlantic coast. During the year the Biological Board of Canada established six stations for this purpose from Grand Manan in the bay of Fundy to Cape Breton island. Particularly on the outer coast of Nova Scotia, as, for example, at Sambro island off Halifax, do rapid changes occur that bring or drive away important fishes, such as cod and haddock. These changes must be correlated over a period of years with the landings of fish for the various districts. The committee believes it desirable to have the statistics of landings reported in a more regular and uniform fashion and is arranging for a system of reporting the statistics that will make accurate comparison easier.

Special investigations of cod, haddock, and mackerel have been in progress and important findings have been reviewed by the committee. The cod of western Nova Scotia are relatively stationary, migrating very short distances, though some may travel westward to Rhode Island and eastward to Miquelon. The cod around Cape Breton island in eastern Nova Scotia do not seem to be as thoroughly fished as those to the westward, since fewer tagged fish are recaptured. They are not stationary, but migrate out to the Sable island banks during the winter, and may go into the gulf of St. Lawrence as far as the Gaspé coast during the summer. Cape Breton haddock migrate similarly to the cod, but may go south and west during the winter as far as cape Sable, while none of the tagged fish have been reported from points very far inside the gulf during the summer. The mackerel migrate more rapidly than either cod or haddock, but there is no evidence that they go much farther, being distributed from the outer banks during the winter to the southern parts of the gulf of St. Lawrence and the gulf of Maine during the summer. Fluctuations in the abundance of mackerel from year to year are found to be due in large part to very considerable differences in the year classes or stocks of mackerel produced in the various years.

The committee, which held its meeting for 1929 at Ottawa on October 15 and 16, has had under particular consideration the very extensive international

fisheries centred in the entrances to Passamaquoddy bay, which appear to be jeopardized should power dams proposed for those entrances be constructed. A recommendation has been made to the interested governments that an investigation covering at least two years would provide valuable additional data to form a sounder basis than at present exists for predicting the effects of the dams on the fisheries of the region. A smaller project for damming merely Cobscook bay on the Maine side of the boundary line was thought not likely to cause any serious or widespread damage to the fisheries.

INTERNATIONAL HALIBUT COMMISSION

Under the convention between the United States and Canada for the conservation of the Pacific halibut fisheries, the International Fisheries Commission is charged with the duty of making a thorough investigation into the life history of the halibut and of making recommendations to the two Governments for such regulation as may seem desirable for its preservation and development. This implies the maintenance of a system of observation.

As has been recorded in a previous report, the commission has collected material for a continuous record of the past and present of the fishery, thus forming a secure basis for future observation. The report upon this material is now in progress through the press. It shows that the abundance on the older banks has fallen to a sixth in twenty years, and no doubt can remain but that the banks are now much understocked. It may be granted that under undisturbed natural conditions these banks may have been overstocked, but the reverse is certainly now true. The system of observation in effect has during the past year indicated that the decline in abundance continues at a rapid rate throughout the newer banks, and that on the older the catch has reached the minimum upon which the fleet can exist. It has in places become so low as to make the vessels dependent upon other less desirable species, as rock cods.

The first results of the marking experiments were completed during the year and have been issued. They indicate that approximately forty per cent of the stock of commercial sizes on the banks adjacent to British Columbia is removed yearly, a result explaining the present absence of adult spawners there, in harmony with the overfishing shown by the statistics already mentioned. The residual immature population is found to move little and only by a random scattering migration, averaging less than twenty miles between tagging and recovery. A much smaller percentage of the large mature fish of Alaskan banks is caught annually. These are shown to belong to a stock which migrates to and fro along the coast of the Alaska peninsula averaging 200 miles between marking and recovery.

The essential independence of the marketable fish of the banks adjacent to the Alaskan and Canadian coasts is demonstrated, and it is proved that each must be held responsible for bringing its quota of spawning fish to maturity. The previous recommendations of the commission are completely supported by the detailed findings.

Other reports completed during the year include a history of the fishery, showing that it has maintained its yield solely by means of constant expansion and by continually increased economy and efficiency rather than by the persistence of the supply available. Hydrographic studies of the velocity and direction of the currents which carry the eggs and larvæ have also been completed. It is indicated that the latter are carried westward from the Alaskan spawning grounds and not southward, thereby explaining the complementary migration of the adults. The methods used were those of the International Ice Patrol in forecasting the movement of icebergs.

The marking experiments already reported upon left untouched certain problems as to the migration of mature on the coast of British Columbia, of

immature along the Alaskan Coast, and of both classes at the western extreme of the fishery. Accordingly, during the year the experiments were extended to tag a sample of 928 fish at the Shumagin islands, in April and May of 1929, and of 712 on the west coast of the Queen Charlotte islands in March and April of 1930. The returns from these and the earlier experiments were compiled and in process of analysis during the year. It is thought that development of facts uncovered by the first tagging report will greatly facilitate observation of the condition of the fishery and its changes.

The eggs and larvæ are spawned in the period from late December to March and float freely in the ocean waters at various depths. Net hauls are made for the purposes of determining (1) the relationship of spawning grounds to those occupied by the immature sizes and to the migratory routes of the mature, and (2) the source of whatever eggs and larvæ may be maintaining the fisheries on the banks adjacent to British Columbia, which are greatly depleted.

To the end that it may be known to what extent larvæ are spawned in Canadian waters, 100 hauls were made in April, 1929, between cape Flattery and Dixon entrance, particularly over the famous Goose island ground, and in May, 1930, in Hecate strait and Dixon entrance, also a series off the West Coast of the Queen Charlotte islands. The scarcity of larvæ taken off British Columbia contrasted sharply with the relative abundance in the waters off the western Alaskan coast, and apparently indicated that there were few spawning fish off the Canadian coast.

The month of May is, however, too soon after the spawning season to expect any great influx of larvæ drifting from Alaskan areas. As a basis for the determination of this drift and to compare the abundance off British Columbia with that at the same season off Alaska a preliminary series of 110 hauls was taken in the gulf of Alaska in late March and the first week of April, 1929. These indicated the occasional presence of larvæ well out in the gulf of Alaska, perhaps in numbers sufficient to explain their presence off British Columbia, although they were much less abundant than they were along the edge of the continental slope of the Alaskan coast. It therefore became obvious that a much more extensive and better distributed series of net hauls were necessary to study the actual drift. Accordingly, during late February and early March in 1930, 55 hauls were made and 150 during April. Although positive statement cannot presently be made it seems that as late as May 1 those stations made along a line between Dixon entrance and Trinity islands were barren of larvæ, while at least some specimens, whatever their number, were taken in hauls north of this line, the greater number again along the continental slope. Since even at this date the larvæ were not far advanced, it is plain that further work in late May and June must be done, before an answer is available to the query as to the amount and time of the larval drift.

Further work on the materials already collected for analysis of the life-history has been continually under way and further reports are expected from time to time, notably upon racial characteristics and growth rate.

INTERNATIONAL PACIFIC SALMON FEDERATION

The 1930 meeting of the International Pacific Salmon Federation, which was formed in 1925 primarily for the purpose of establishing closer co-operation between United States and Canadian authorities in the study of problems of salmon life in the North Pacific area, was held at Stanford University, Palo Alto, California, on March 28 and 29. The Federation is made up of representatives of Canada, the United States, the State of Washington, the State of Oregon, and the State of California. Representing Canada are Dr. W. A. Clemens, Director of the Pacific Biological Station of the Biological Board of Canada, Mr. J. P. Babcock, Deputy Commissioner of Fisheries for the Province

of British Columbia, and the undersigned, or, in his absence, Major J. A. Motherwell, the department's Chief Supervisor of Fisheries for British Columbia. Major Motherwell, Dr. Clemens, and Mr. Babcock were in attendance at the 1930 meeting which heard papers on various subjects and discussion on these subjects and related questions. Dr. R. E. Foerster and Dr. A. L. Pritchard, of the staff of the Biological Board, were also present. By direction of the department two questions were brought particularly to the attention of the meeting: "Water Power Development as it Affects the Fisheries, and the Progress Made to Overcome or Minimize the Difficulties of the Passage of Fish over High Dams, both in Upstream and Downstream Migration," and "Counting Fences, their Construction and the Results Secured in Returns from Known Escapements."

PELAGIC SEALING TREATY

The Pelagic Sealing Treaty, which became effective in 1911, continues to operate satisfactorily, so far as the American and Japanese herds are concerned. Until the question of diplomatic relations with Russia on the part of all concerned has become settled, however, it is unlikely that the treaty will be in full operation as regards the Russian herd. It has not been possible in recent years to obtain any reliable information as to the situation in regard to the herds on the Russian islands. The successful operation of the treaty so far as the American and Japanese herds are concerned is evidenced by the increase in the number of seals in these herds which has taken place since the treaty became operative. When the treaty was made in 1911, the American herd had been reduced to approximately 125,000 seals, while the last census report, 1928, showed a total of 871,513. This increase occurred notwithstanding that the number of selected seals taken annually is being increased from time to time. In 1928 the total number of seal skins taken was 31,099.

The Japanese rookeries are small so there is not room for great increase. None the less the herd there is also being built up, as is shown by the fact that, while it numbered only 9,041 seals when the treaty became effective, the latest information available now shows a seal population of over 30,000.

During the present fiscal year the payment to Canada under the treaty was \$62,507.32.

Your obedient servant,

WILLIAM A. FOUND,

Deputy Minister of Fisheries.

APPENDIX NO. 1

REPORTS OF SUPERVISORS OF FISHERIES

REPORT OF ACTING CHIEF SUPERVISOR SHREVE, PROVINCE OF
NOVA SCOTIA, FOR 1929

The value of the fisheries of the province of Nova Scotia for the year 1929 amounted to \$11,455,491, a decrease of \$126,504 from the previous year when the marketed value amounted to \$11,681,995. The figures for 1929, however, are not at all discouraging, as a review of the past eight previous years will show that the 1929 value has only been exceeded in the years 1926 and 1920.

The value of the fisheries of the province for the past nine years has been as follows:—

1920.....	\$ 12,742,659
1921.....	9,778,623
1922.....	10,209,258
1923.....	8,448,385
1924.....	8,777,251
1925.....	10,213,779
1926.....	12,505,922
1927.....	10,783,631
1928.....	11,681,995
1929.....	11,455,491

There was continued expansion and development made in connection with the fresh fish industry, and this development will undoubtedly continue with the increase of cold storage plants and the further improvement of quick freezing methods. The future of the fresh fish industry of this province is particularly promising as new markets are being continually developed, and improved methods in freezing, refrigeration, transportation, etc., enable the product to be placed on far distant markets in perfect condition.

The cod fishery while showing a decrease in 1929 from the catch of the previous year continued to maintain its rank as usual in first position, the lobster and haddock fisheries ranking next in importance, respectively. All of the commercial fisheries showed increased catches with the exception of the cod, scallop and swordfish fisheries.

COD

The cod fishery showed a decrease of \$893,436 in value as compared with the year 1928. This decrease was mainly responsible for the drop in the marketed value of the fisheries as a whole.

The catch amounted to 1,297,841 cwt., having a landed value of \$2,537,322, and a marketed value of \$3,504,583, as compared with a catch of 1,470,172 cwt., landed value of \$2,822,472 and a marketed value of \$4,398,019 in 1928.

LOBSTERS

The total lobster catch in 1929 was 190,035 cwt. having a marketed value of \$3,210,504, as compared with 172,409 cwt. having a marketed value of \$3,048,255 in 1928. The total pack of canned lobsters was 60,661 cases as compared with 55,277 cases in the previous year. The total marketed value for the year under review was \$3,210,504, as compared with \$3,048,255 for 1928.

There was a considerable increase in the amount of lobsters shipped in shell. During 1929 the quantity so shipped amounted to 73,582 cwt. while during the preceding year 66,239 cwt. were shipped. Shipment of the lobsters in shell is being extended and is now carried on from districts where formerly all lobsters caught were canned.

The trade, with American centres such as New York, Boston and Portland, which at one time was confined to points in Western Nova Scotia, was extended into eastern areas in 1929. The Canadian demand for lobsters in a fresh state was also found to be increasing.

In spite of the large proportion of the catch sold in the shell the quantities canned during 1929 exceeded the amount canned during the previous year by 5,384 cases. Although the markets for tomalley and lobster paste do not encourage the pack of these by-products, 3,151 cases were put up as compared with 3,226 cases in 1928. Very few complaints of a serious nature regarding the qualities of the canned product have been reported.

The size of the packs of Japanese crab meat and South African crayfish and the prices at which these commodities can or will be sold, will undoubtedly affect the demand for canned lobsters. However, in view of the quantity of lobsters caught and packed in Nova Scotia, as compared with other sections, it should not be difficult to control marketing and standardizing of quality and other features despite any competition from crabmeat and crayfish.

The lobster fishermen suffered heavy losses during the spring through storms that played havoc along the coast. The fishermen lost much of their equipment in various sections. While lobsters were plentiful, the weather for the most part was such that fishermen were unable to operate to full advantage.

The catch in the Northumberland straits district was one of the largest for many years. The catch in the island of Cape Breton showed a considerable increase as compared with the preceding year. Western Nova Scotia was not so fortunate, and a decrease occurred in that section. No extensions for the lobster seasons were granted for any part of the coast during the year.

HADDOCK

The year's landings of haddock amounted to 516,149 cwt. as compared with 445,950 cwt. in the preceding year, an increase of 70,199 cwt. The landed value for the year was \$990,847, and the marketed value \$1,871,947, as compared with a landed value of \$917,404, and a marketed value of \$1,654,977 in 1928. The increase in the landed value was \$73,443 and in the marketed value the increase amounted to \$216,970.

HERRING

The increase in the herring catch was general along the coast. The landings amounted to 516,149 cwt. as compared with 445,940 cwt. during 1928. The increase in the catch was 71,340 cwt., while the increase in the marketed value amounted to \$157,742. The catch was the largest since 1926.

HALIBUT

The halibut fishery showed a gain both in the amount of fish landed and the marketed value. The catch was 30,971 cwt. as against 25,768 cwt. in 1928, an increase of 5,203 cwt., while the marketed value showed an increase of \$72,866. The western section of the province was responsible for the increased landings of halibut, as decreases were registered in the eastern mainland section as well as in the island of Cape Breton. The decreases in eastern Nova Scotia, both mainland and Cape Breton, were due to smaller trawler landings.

MACKEREL

In the mackerel fishery there was a very considerable increase in the catch as well as in the landed and marketed value; in fact the catch has not been exceeded for some years past. All told, 107,385 cwt. were landed, as compared with 71,440 cwt. in 1928. The landed value amounted to \$269,841 and the marketed value \$387,179, as compared with a landed value of \$244,916 and a marketed value of \$369,752 for the previous year. The increase in the marketed value amounted to \$17,427. Heavy increases were shown on the island of Cape Breton, where mackerel were exceptionally plentiful and the weather unusually good during the time the fish were on the coast. The catch in this district would have been even greater had not the fishermen been obliged to discontinue operations when they ran out of salt and containers. There was also a substantial increase in Guysboro County West, where only spring mackerel are taken, and a heavy catch in Guysboro County East during the month of June. A considerable part of the increase in the catch was registered in the western section of the province.

HAKE AND CUSK

The landings of hake and cusk amounted to 184,713 cwt. as compared with 158,744 for the previous year, an increase of 25,969 cwt. The landed value for the year was \$145,190 and the marketed value \$321,772 as compared with a landed value of \$132,046 and a marketed value of \$268,577 for the year 1928. The increase in the marketed value amounted to \$53,195.

SALMON

There was an increase of 497 cwt. in the salmon fishery, and 7,556 cwt. were landed as compared with 7,059 cwt. last year. These catches, however, do not compare favourably with those of previous years. The marketed value of the catch for 1929 amounted to \$155,651 as compared with \$138,681, an increase of \$16,970. Increased landings were made on the island of Cape Breton and western Nova Scotia, but the eastern portion of the mainland had the smallest catch for a number of years.

SMELTS

The total smelt catch for the year was 7,184 cwt. with a marketed value of \$119,659 as compared with a catch of 6,089 cwt. valued at \$103,535 during 1928. The increase in the catch amounted to 1,095 cwt. and the marketed value \$16,124. The increase in landings was general along all sections of the coast.

SCALLOPS

The scallop fishery showed a decrease of 7,677 barrels as compared with the previous year's landings. In 1928, 24,533 barrels were landed, as compared with 16,856 bbls. for the present year. In 1929 the catch was the smallest since 1924. The marketed value for the year amounted to \$110,192 as against \$156,188 for the previous year, a decrease of \$45,996. The decline in the catch is attributed to bad weather and depleted beds. The fishery was not prosecuted in the bay of Fundy section as vigorously as in former years, and the catch in the Digby-Annapolis district fell off to a great extent. The catch for the province, by years, for the past seven years has been as follows:—

	Barrels
1923.....	11,839
1924.....	7,504
1925.....	12,404
1926.....	19,918
1927.....	37,607
1928.....	24,533
1929.....	16,856

The marketed value for the years referred to above is shown in the following table:—

1923.....	\$ 72,547
1924.....	51,793
1925.....	76,025
1926.....	138,472
1927.....	212,838
1928.....	156,188
1929.....	110,192

SWORDFISH

The swordfishery was not a success. There was a decrease of 1,752 cwt. in catch and a decrease in the marketed value of \$34,104. Last year 8,088 cwt. were landed, while in 1929 the catch amounted to only 6,336 cwt. The marketed value for the respective years was \$132,345 and \$98,241. The decrease in the fishery was general in the swordfishing areas. On the island of Cape Breton unfavourable weather prevailed during the swordfishing season, greatly interfering with the operations of the fishermen. The largest landings made on the island of Cape Breton were at the following points:—

Louisburg.....	3,265 cwt.
Petit de Grat.....	446 "
North Sydney.....	431 "
Glace Bay.....	302 "
South Ingonish.....	224 "

On the eastern portion of the mainland the heaviest catches were made in Guysboro county, but there was a decrease of 742 cwt.

DISTRICT NO. 1—CAPE BRETON—SUPERVISOR McLEOD

The outstanding features of the year in District No. 1, as compared with 1928, were increases in the quantities landed of haddock, pollock, herring, mackerel, alewives, salmon, smelts, lobsters, flounders, and squid; and decreases in cod, hake, halibut, swordfish, eels, and oysters.

From the standpoint of values, lobsters ranked first, cod second, haddock third, mackerel fourth, swordfish fifth, salmon sixth, halibut seventh, herring eighth, and smelts ninth.

Lobsters.—The total catch was 41,786 cwt. valued at \$318,348, as compared with 39,237 cwt. with a landed value of \$311,142 for 1928, an increase of 2,549 cwt. in the catch and \$7,206 in the landed value. The largest catches of lobsters were landed at Main-a-Dieu, Port Hood island, Port Morien, Petit de Grat, Aspy Bay, and Gabarus.

Cod.—The total cod catch was 148,322 cwt. valued at \$240,455, as compared with 153,689 cwt. valued at \$237,050 in 1928. Although the catch showed a decrease of 5,367 cwt. the landed value increased by \$3,405 as compared with the preceding year, a condition due to a greater percentage of the catch having been sold in a fresh state.

The largest landings of haddock were at South Ingonish, 31,520 cwt.; Petit de Grat, 13,237 cwt.; North Ingonish, 10,410 cwt.; North Sydney, 3,955 cwt.

Mackerel.—The total catch was 49,495 cwt. with a landed value of \$95,423, as compared with 27,970 cwt. with a landed value of \$60,678 for 1928. Compared with the preceding year there were increases of 21,525 cwt. in the catch, and \$34,745 in the landed value. In the section from Pleasant bay to Hawkesbury a decrease of 934 cwt. was shown, mackerel having been very scarce during September, October and November. It is remarkable that most of the catch in this district was taken in gill-nets during July and August; in former years the greater part of the catch was taken by jigging. At Pleasant bay 300 cwt. were taken in a purse seine.

The largest landings were at L'Ardoise, 6,456 cwt.; South Ingonish, 6,040 cwt.; Lower L'Ardoise, 4,482 cwt.; and Louisburg, 4,397 cwt.

Swordfish.—The total catch was 5,107 cwt. with a landed value of \$57,950 as compared with 6,080 cwt. with a landed value of \$85,147 in 1928. Although decreases of 973 cwt. in the catch and \$27,197 in the landed value were recorded, it is abundantly evident that these fish were quite plentiful, but the unfavourable weather that prevailed during the entire season greatly interfered with operations and resulted in the falling off noted.

The ports and districts where decreases took place are as follows: Arichat, 16 cwt.; Petit de Grat, 84 cwt.; St. Peters to Fourchu, 93 cwt.; Gabarus to Kennington Cove, 132 cwt.; Glace Bay, 181 cwt.; North Sydney, 113 cwt. Louisburg reported an increase of 342 cwt.; and Main-a-Dieu an increase of 34 cwt.

The largest landings took place at Louisburg, 3,265 cwt.; Petit de Grat, 446 cwt.; North Sydney, 431 cwt.; Glace Bay, 302 cwt.; and South Ingonish, 224 cwt.

Salmon.—The total catch of salmon was 3,203 cwt. with a landed value of \$44,091, as compared with 2,555 cwt. with a landed value of \$33,870 for 1928. There was a gratifying increase of 648 cwt. in the catch and \$10,221 in landed value.

The largest landings were at Margaree Harbour, 630 cwt.; Pleasant Bay, 288 cwt.; Cheticamp, 275 cwt.; Mabou Harbour, 258 cwt.; St. Ann's, 210 cwt.

Halibut.—The catch of halibut totalled 4,017 cwt. with a landed value of \$43,977, as compared with 4,758 cwt. valued at \$45,749, showing a decrease of 741 cwt. in the catch and \$1,722 in the landed value.

Decreases occurred as follows: Pleasant Bay to Margaree Harbour, 37 cwt.; Hawkesbury, 150 cwt.; Louisburg to Glace Bay, 66 cwt.; Lingan to North Sydney, 300 cwt.; Ingonish to Bay St. Lawrence, 148 cwt.

The decreased catch was due to scarcity of fish and to smaller landings by the trawlers at Hawkesbury, and the Lunenburg bankers at North Sydney.

Herring.—The total catch was 41,086 cwt. with a landed value of \$40,157, as compared with 37,999 cwt. with a landed value of \$30,298 for 1928, showing an increase of 3,087 cwt. in the catch and \$9,859 in the landed value.

The largest landings were at North Sydney, 6,160 cwt.; St. Ann's, 4,580 cwt.; Petit de Grat, 3,478 cwt.; Arichat, 1,600 cwt. and Cheticamp, 1,550 cwt.

Smelts.—The catch was 1,964 cwt. with a landed value of \$17,914 as compared with 1,636 cwt. with a landed value of \$18,517 for 1928, an increase of 328 cwt. in the catch, but a decrease of \$603 in landed value.

St. Ann's reported a substantial increase of 88 cwt., which was attributed to the smelts being more plentiful and to the ice forming in the estuaries in December, which enabled bag-net fishermen to begin operations earlier in the season than usual.

Hake.—The total hake catch was 7,365 cwt. with a landed value of \$6,077, as compared with 7,646 cwt. with a landed value of \$6,252 for 1928, showing a decrease of 281 cwt. in the catch and \$175 in the landed value.

Oysters.—The landings of oysters were 979 barrels with a landed value of \$3,989 as compared with 1,265 barrels and a landed value of \$6,549 for 1928, showing a decrease of 286 barrels in the catch and \$1,560 in the landed value.

The following decreases were recorded: Orangedale and River Denys Basin, 176 barrels; Nyanza, 72 barrels; Estmers, 35 barrels; Ottawa Brook, 32 barrels; Washabuck, 19 barrels; East Bay, 12 barrels.

In the Little Narrows district there was an increase of 103 barrels.

The large decrease at Orangedale and River Denys basin was due partly to scarcity of oysters, and partly to early frost and stormy weather preventing continuous operations.

Squid.—The total catch was 1,354 barrels with a landed value of \$2,843, as compared with 1,085 barrels with a landed value of \$1,236 for 1928, an increase of 269 barrels in the catch and \$1,607 in the landed value.

Squid were unusually scarce, except in the waters of Sydney harbour where the catch showed an increase of 555 barrels as compared with the preceding year.

Flounders.—The flounder catch totalled 889 cwt. with a landed value of \$933 as compared with 664 cwt. with a landed value of \$771 for 1928, a decrease of 225 cwt. in the catch and \$162 in the landed value.

All the flounders caught were taken in gill-nets in Margaree Harbour, and the catch would have been very much larger if there had been any demand for the fish.

Shad.—The total catch was 149 cwt. with a landed value of \$418. None were caught in 1928. Fifteen cwt. were landed at Little Lorraine and 134 cwt. in the district between Ingonish and bay St. Lawrence.

Pollock.—The total catch was 432 cwt. with a landed value of \$297, as compared with 290 cwt. with a landed value of \$344 for 1928, showing an increase of 142 cwt. in the catch and a decrease in the landed value of \$47.

Most of the pollock were landed by trawlers at Hawkesbury. It has been observed recently that these fish have not frequented the coast in such large quantities as in former years. Large catches used to be taken in the trap-nets at L'Ardoise, but since 1927 practically none have been taken there.

DISTRICT NO. 2—COMPRISING THE COUNTIES OF HALIFAX, GUYSBORO, PICTOU, COLCHESTER, CUMBERLAND AND HANTS—SUPERVISOR D. H. SUTHERLAND

The total quantities of all varieties of fish landed in the district in 1929 was 73,321,100 pounds valued at the boat's side at \$2,205,162 which is an increase of 383,200 pounds and \$178,153 as compared with the previous year. The greatly increased catch of lobsters of 8,884,100 pounds, compared with 6,776,400 pounds for 1928, was mainly responsible for the increase in landed value. Of the thirty-one varieties of fish taken, sixteen showed an increase in the quantity landed; these, principally, were hake, pollock, herring, lobsters, mackerel and clams. The greatest decrease was in cod—4,740,300. Haddock and soles also showed considerable decreases, due to the fact that fewer steam trawlers were operated during the year. Eight trawlers operated as compared with eleven in 1928. The inshore catches of cod, however, were considerably greater than during the previous year.

The total marketed value for the year was about the same as in 1928, being \$4,456,660 as compared with \$4,457,159. An increase in lobsters of \$313,059 and herring \$68,723 overcame decreases in cod, \$190,466, haddock, \$76,428, halibut,

\$30,632, salmon, \$56,575 and fish meal, \$43,677. It should be noted that marketed value includes the value of shipments brought into this district from outside points.

Cod.—The total catch was 228,611 cwt. with a landed value of \$423,075 and a marketed value of \$939,939 as compared with 276,014 cwt. with a landed value of \$496,668 and a marketed value of \$1,130,405 for 1928, showing a decrease of 47,403 cwt. in the catch, \$73,539 in the landed value and \$190,466 in the marketed value. All told, 33,382 cwt. were brought into the district from outside points in 1929 as compared with 35,600 cwt. in 1928. The values of these intershipments are included in the marketed value figures.

The decrease in catch was in Halifax county West and Guysboro county East, where, respectively, 24,023 cwt. less and 25,287 cwt. less were landed, than that in 1928. The decline was due to fewer steam trawlers operating as the shore catch in Halifax county East and all of Guysboro county showed an increase in 1929. Of the year's total catch 158,949 cwt. were taken inshore.

Haddock.—The total catch was 232,020 cwt., with a landed value of \$495,658 and a marketed value of \$990,209, as compared with 241,502 cwt. with a landed value of \$460,833 and a marketed value of \$1,066,637 for 1928, showing a decrease of 9,482 cwt. in the catch, \$33,825 in the landed value and \$76,428 in the marketed value. As in the case of cod, considerable quantities were brought into this district from outside points and included in the marketed value totals. In 1929, these receipts from outside the district were 12,935 cwt. and in 1928 12,168 cwt., mostly from Cape Breton island. Of the total catch during the year 23,471 cwt. were taken inshore as compared with 26,816 cwt. in 1928.

The decrease was in Guysboro county West where there were 17,409 cwt. less landed, Halifax county West showing an increase of 13,263 cwt. This change was due to fewer steam trawlers operating from Canso.

Hake.—The total catch was 12,070 cwt. with a landed value of \$11,675 and a marketed value of \$28,953, as compared with 7,568 cwt. with a landed value of \$7,089 and a marketed value of \$22,771 for 1928, showing an increase of 4,412 cwt. and \$4,586 in the landed value and \$6,182 in the marketed value.

The increase occurred in Halifax county West and Guysboro county West with increased catches of 4,176 cwt. and 1,000 cwt., respectively. The inshore catch was 8,568 cwt. as compared with 5,667 cwt. in 1928.

Pollock.—The total pollock catch was 11,639 cwt. with a landed value of \$10,708 and a marketed value of \$17,370, as compared with 6,232 cwt. with a landed value of \$6,165 and a marketed value of \$15,836, showing an increase of 5,407 cwt. and \$4,543 in the landed value and \$1,534 in the marketed value. Of the catch 1,909 cwt. were taken inshore as compared with 1,725 cwt. in 1928. The increase was entirely due to heavy offshore landings in Halifax county West.

Halibut.—The total catch of halibut was 6,541 cwt. with a landed value of \$84,567 and a marketed value of \$146,036, as compared with 7,051 cwt. with a landed value of \$83,355 and a marketed value of \$176,668 for the 1928 season, an increase of 510 cwt. in catch, \$1,212 in the landed value and \$30,632 in the marketed value. Of the catch, 2,001 cwt. were taken inshore as compared with 2,648 cwt. in 1928. During the year 403 cwt. were brought into this district as compared with 1,187 cwt. in 1928, which accounts for the considerable decrease in marketed value.

The decrease was almost entirely in Guysboro county East, where smaller trawler landings were made.

Herring.—The total catch was 72,222 cwt. with a landed value of \$74,295 and a marketed value of \$188,637, as compared with 50,241 cwt. with a landed

value of \$56,857 and a marketed value of \$118,934 for 1928, showing an increase of 21,981 cwt. and \$17,438 in the landed value and \$69,703 in the marketed value.

While the catch of 1928 was the lowest for the past five years, the 1929 catch was the greatest. The increase was due to landings in Halifax county West of 9,766 cwt., Halifax East 9,080 cwt., Guysboro East 5,778 cwt. The spring catch in Cumberland county West was only 1,225 cwt., as compared with 7,900 cwt. in 1928. Usually the catch in this section, where the fish are used for bait and hard smoking, is 16,000 cwt. In August and September there was a heavy run of herring in Halifax county, west of Halifax.

Mackerel.—The mackerel catch was 37,496 cwt. with a landed value of \$108,284 and a marketed value of \$156,362, as compared with 29,582 cwt. with a landed value of \$103,673 and a marketed value of \$157,460 for 1928, an increase of 7,914 cwt. with \$4,611 in the landed value and \$1,098 in the marketed value. While the catch compared favourably with the quantities taken during the past four years, it was only about half the quantity taken in 1925.

The catch in Halifax County West, a big producing section, dropped 6,500 cwt., the fall fishing being a complete failure. In Guysboro county West, where only Spring mackerel are taken, the catch was very heavy in June, 14,450 cwt. being taken as compared with 4,623 cwt. in 1928. Guysboro county East also had a heavy catch in June—7,473 cwt. as compared with 2,512 cwt. in 1928. On the other hand, the fall fishing was not good.

Salmon.—The total catch of salmon was 3,303 cwt. with a landed value of \$56,977 and a marketed value of \$113,526, as compared with 3,676 cwt. with a landed value of \$59,515 and a marketed value of \$170,101.

The catch was the smallest for a number of years in this district. The decrease was 373 cwt. and \$2,538 in the landed value and \$56,575 in the marketed value. Slightly more than 1,600 cwt. were imported as compared with 3,536 cwt. in 1928, and this decline partly accounted for the greatly decreased marketed value.

Albacore.—The total catch was 1,454 cwt. with a landed value of \$9,212 and a marketed value of \$21,810, as compared with 875 cwt. with a landed value of \$5,120 and a marketed value of \$8,750, an increase of 579 cwt. in the catch, \$4,092 in the landed value and \$13,060 in the marketed value.

This fishery was quite successful, and the catch compared favourably with that of recent years. The fishery is confined entirely to St. Margaret's Bay district and the catch is shipped to the United States market. The 1927 catch was 1,575 cwt., the largest since 1923.

Swordfish.—The catch of swordfish was 1,114 cwt. with a landed value of \$10,561 and a marketed value of \$31,624, as compared with 2,098 cwt. with a landed value of \$28,874 and a marketed value of \$40,227 for 1928.

Swordfishing was not successful, and there was a decrease of 984 cwt. in catch, \$18,313 in landed value, and \$8,603 in marketed value. The decrease was general along the Atlantic coast of this district. The heaviest catches of swordfish are made in Guysboro county, where the decrease in 1929 was 742 cwt.

Flounders, Skate and Soles.—The catch of flounders was 402 cwt. less than for 1928. Soles decreased 4,521 cwt. and skate 565 cwt., due to a smaller number of steam trawlers operating. The skate in question included marketable fish only.

Clams.—The total catch was 8,755 cwt. with a landed value of \$8,795 and a marketed value of \$43,441, as compared with 2,088 cwt. with a landed value of \$2,261 and a marketed value of \$12,163 for 1928, showing an increase of 6,667 cwt. in the catch, \$6,534 in the landed value and \$31,278 in the marketed value.

The increase took place in Halifax county East, where a large clam cannery is operated.

Lobsters.—Landings of lobsters were 88,841 cwt., with a landed value of \$813,283 and a marketed value of \$1,407,792, as compared with 67,764 cwt., a landed value of \$616,771 and a marketed value of \$1,094,784 in 1928, an increase of 21,077 cwt. in catch, \$196,512 in the landed value and \$313,008 in the marketed value.

The lobster fishery for 1929 was by far the outstanding feature and surpassed the fishery in any year back to 1917.

DISTRICT No. 3.—Comprising the Counties of Lunenburg, Queens, Shelburne, Yarmouth, Digby, Annapolis, and Kings.

Total landings in the district during 1929 were 1,578,447 cwt. of fish and 22,688 bbls. of shellfish with a total value of \$4,147,430 as compared with 1,538,476 cwt. of fish and 40,720 bbls. of shellfish with a total value of \$5,970,206 in 1928, an increase of 39,971 cwt. of fish and a decrease of 18,032 bbls. of shellfish in 1929 and a decrease in the total value of \$1,822,776.

Cod.—The catch of cod was 920,319 cwt. valued at \$1,873,484, as compared with 1,040,379 cwt. valued at \$2,927,406 in 1928, a decrease of 120,060 cwt. in the catch and \$1,053,922 in the value.

Haddock.—The catch of haddock was 208,346 cwt. valued at \$388,244, as compared with 146,948 cwt. valued at \$266,529, an increase of 61,398 cwt. in the catch and \$121,715 in the value.

Hake and Cusk.—The catch of hake and cusk was 165,401 cwt., valued at \$127,463, as compared with 142,415 cwt. valued at \$116,945 in the previous year, or an increase of 22,986 cwt. in the catch and \$10,518 in the value.

Halibut.—The halibut season in 1929 was more successful than in the year previous, the catch being 20,413 cwt., valued at \$279,403, as compared with 14,161 cwt. valued at \$175,086. There was thus an increase of 6,252 cwt. in the catch and \$104,317 in the value.

Herring.—The catch of herring in the district was 124,427 cwt. valued at \$141,341, as compared with 78,163 cwt. valued at \$83,705, an increase of 46,264 cwt. in the catch and \$57,636 in the value.

Mackerel.—The mackerel catch was 20,454 cwt. valued at \$68,509, as compared with 14,048 cwt. valued at \$80,996, showing an increase of 6,406 cwt. in the catch and \$12,487 in the value.

Salmon.—The catch of salmon was 1,040 cwt. valued at \$24,445, as compared with 855 cwt. valued at \$19,857, showing an increase of 400 cwt. in the catch and \$4,588 in the value.

Scallops.—The catch was 16,856 barrels valued at \$99,670 as compared with 24,533 barrels valued at \$134,675, a decrease of 7,677 barrels in the catch and \$35,005 in the value.

Lobsters.—The lobster catch was 59,411 cwt. with a value of \$1,006,226 as compared with 62,242 cwt. valued at \$1,293,820 in 1928, showing a decrease of 2,831 cwt. in the catch and \$287,594 in the value.

FISH COLLECTION SERVICE

The Fish Collection Service inaugurated by the Fisheries Branch along the southern coast of Cape Breton Island between Main-a-Dieu and Fourchu was resumed in June, and was extended to Port Hood island in November. Eight collecting boats were employed in the service, though not all continuously.

The following is a statement of the quantity of fish carried from the several ports:—

Main-a-Dieu.....	409,670 lbs.
Bauleine.....	40,586 "
Little Lorraine.....	181,109 "
Big Lorraine.....	150,121 "
Louisburg.....	607,510 "
Gabarus.....	101,403 "
Fourchu.....	74,872 "
Port Hood.....	213,784 "
	<hr/> 1,779,055 "

The service has been of great value to the fishermen of this district, although some adverse factors were met, such as exceptionally bad weather and scarcity of fish during late summer and fall months, and cessation of operations during the time that fish were most plentiful on the coast, owing to congestion at Canso.

The service was continued along the mainland covering the same area of the coast as in the previous year, viz., from Halifax to Canso, the fish from Liscomb west being carried to Halifax and the fish from Port Beckerton east being taken to Canso. The ports of call on the two routes in this area were as follows:—

Canso to Port Beckerton.—Port Beckerton, Fishermans Harbour, Isaacs Harbour, Drumhead, Coddles Harbour, Larrys River, Charlos Cove, Cole Harbour, Port Felix, Whitehead and Dover.

Liscomb to Halifax.—Liscomb, Sonora, Marie Joseph, Ecum Secum, Necum Teuch, Port Dufferin, Jeddore, and Ostrea Lake.

Eleven collecting boats, all told, were in operation on these two routes.

For the season the results, in terms of fish carried, were as follows compared with 1928 results:—

Canso to Port Beckerton—

1929—3,056,967 pounds.

1928—3,322,216 pounds.

Liscomb to Halifax—

1929—846,970 pounds.

1928—964,963 pounds.

The decrease of 383,242 pounds in 1929 was not so much due to scarcity of fish as to the fact that during two of the best fishing periods so much fish was being brought to Canso that the firms there were unable to handle quantities and, therefore, were obliged to stop buying for these periods. The comparison is also influenced by the fact that the total carriage shown for the Liscomb-Halifax service for 1928 included herring taken from points in Halifax county West and Lunenburg county.

Three boats were in operation along the southwestern shore. The *Phyllis C* collected fish at Westport, Freeport, and Tiverton and conveyed it to Digby. This boat began operations on May 6 and continued in the Service until February 15, 1930, handling 2,212,114 pounds of fish.

The *Harvey* and *Ralph* operated in the above mentioned district, commencing operations on October 8 and continuing until January 10, during which time 587,155 pounds of fish were handled.

The *Kenneth W* went into operation on October 29 and continued until December 14, operating between Port LaTour, Cape Negro Island, Ingomar, Lockeport. During the month of November when Lockeport was over-supplied, five trips were made to Liverpool. All told, the vessel handled 141,054 pounds of fish.

STEAM TRAWLERS

Eight steam trawlers operated as follows during the year as compared with eleven during 1928:—

Name of Vessel	Time engaged	Port operated from
<i>Good Hope</i>	January-March.....	Halifax
<i>Cape Agulhus</i>	January-April.....	Halifax
<i>Loubyrne</i>	January-December.....	Halifax and Port Hawkesbury
<i>Rayon d'Or</i>	January-December.....	Halifax and Canso
<i>Venosta</i>	January-December.....	Halifax
<i>Viernoe</i>	January-December.....	Halifax
<i>St. Cuthbert</i>	January-December.....	Halifax
<i>Lemberg</i>	January-December.....	Halifax

The baby trawler *Geraldine* also operated for the W. C. Smith Vessel Company, Lunenburg.

The trawler *Good Hope*, owned and operated by the National Fish Company, was sunk at the entrance of Halifax Harbour on March 16, when hit in a dense fog by a Norwegian liner.

BROADCAST OF FISHERIES INFORMATION AND BAIT REPORTING SERVICE

The daily fisheries radio broadcast service was resumed on April 2 and continued throughout the year.

More and more vessels have added radio sets to their equipment and the broadcast service inaugurated by the department in 1927 has been considerably expanded, giving the fishermen and others interested in the fishing industry further information of interest. This service is much appreciated by the captains and crews of the bank fishing fleets, as well as by others interested in the fisheries.

The items broadcast not only included information with regard to weather conditions, ice reports, bait reports, prices paid for fish, but news items, and urgent information such as loss of life, illness in the families of fishermen, as well as other news of interest to the men of the fleet.

Information was collected by telegraph and telephone, from the fisheries officers along the coast, compiled by the Halifax office and broadcast twice daily from the Louisburg Marconi Station and the Halifax Lightship. The broadcast was also repeated on the Banks from C.G.S. *Arras* which was equipped with a new 100 watt I.C.W. Transmitter for the purpose of rebroadcasting the daily reports from the Louisburg station. The station does not reach at all times all points on the banks, and by means of the rebroadcasting service from the *Arras* all sections were reached and the whole fleet kept in touch with vital matters pertaining to the industry.

This service is only in its infancy and its future offers unlimited possibilities, which are naturally more or less dependent upon the further progress and development of radio. The ordinary fishing vessel is not equipped with wireless apparatus, and therefore cannot be reached by a wireless message, but as the vessels are practically without exception now furnished with radio sets, they can be reached by voice broadcast and their movements thereby directed by their owners. Many valuable messages of this kind have been transmitted, through this service, to various vessels at sea.

LUNENBURG FLEET

The total catch for the Lunenburg fishing fleet for 1929 was the smallest that has been landed since the year 1924. Altogether 208,700 quintals were

landed, while in 1928 the catch went up to 225,775 quintals. The value of the catch was approximately \$2,000,000 in 1928 but for 1929 it will be considerably lower. The Summer catch in 1929 brought \$8.50 and \$9 per quintal.

The catch at LaHave and Riverport was some 25,000 quintals short of the landings in the previous year.

The catch of the frozen baiting trip for the year amounted to 30,125 quintals which was landed by 59 line trawlers. In the previous year 57 line trawlers landed 32,870 quintals on the same trip.

On the spring trip 65 line trawlers and 5 hand liners landed 55,450 quintals, while 69 line trawlers and 6 hand liners landed nearly the same number of quintals in 1928.

The catch for the summer trip by 66 line trawlers and 5 hand liners amounted to 110,950 quintals, as compared with a catch for the corresponding trip in 1928 of 135,600 quintals.

The schooner *Harriet* and *Vivian* was the high liner among the trawlers, with a catch of 4,400 quintals, but the schooners *Ronald George* and *Bessemer*, each with a catch of 4,200 quintals, were close behind.

The schooner *Eva U*, was the highest of the hand liners. The hand line fleet, which was formerly quite large has decreased, until in the 1929 season there were but five of that type of schooners operating. They had poor luck on their Spring trip, but were more successful on the summer trip, and therefore their average for the year was fair.

The frozen bait trip in 1928 was sold at \$7.50 per quintal, the spring trip brought \$8 and the summer catch \$9 per quintal. In 1929 the frozen baiting trip brought from \$7 to \$7.50, the spring trip \$8 and the summer trip from \$8.50 to \$9.

During the past two years there has been a rather unusual development in the Lunenburg Bank fleet's methods with regard to a fall Bank fishing trip. In past years when the vessels returned in September they finished until the following spring, but 17 vessels outfitted for a fall trip in 1928 and this year 12 vessels outfitted and returned to the Banks. The fish catch of this trip will not be cured and sold before next spring.

The only schooner of the fleet that was lost during the year was the *Mahaska*, which was sunk in collision with the French trawler *Remy Chuinard* during the latter part of March. Two members of the crew, John Fleet and William Hardy, lost their lives in the collision. Only four minutes elapsed between the crash and the sinking of the schooner. This is the second vessel of the Lunenburg fleet within a short time to meet this fate, as last year the Lunenburg fishing schooner *Andrava* was sunk in collision with a French trawler in Sydney harbour.

A number of schooners have been sold to Newfoundland during the past season. A number of new ones have been added to the fleet and there are new vessels under construction.

The fleet was furnished by radio with daily reports regarding ice, bait conditions, and other news of interest to the members of the crew, the information being compiled at the Halifax office.

FISHERIES EXHIBITION

The first fisheries exhibition of its kind in the history of the Dominion was held at Lunenburg on September 16, 17, and 18, 1929, and the success with which it was attended has inspired those responsible for its inception to greater efforts for next year. In the past Lunenburg has celebrated the return of the fishermen with a picnic or a reunion, but this year the celebration was expanded into an exhibition, and became an event of national importance.

The exhibition was officially opened by W. A. Found, Deputy Minister of Fisheries. The Fisheries Branch assisted towards the success of the fair, granting a subsidy and sending fish culture displays, etc.

The exhibits were numerous and, with very few exceptions, were all directly or indirectly connected with the fishing industry. Fish dealers displayed many varied and attractive lines of fresh, frozen, smoked and dried fish, etc. Firms dealing in ships' supplies, blockmakers, net and cordage representatives, paint manufacturers, marine engine manufacturers, dory makers, sail makers and others supplying material used in connection with the fishing industry had attractive booths.

The Fisheries Branch had several displays. One from the hatcheries of the maritimes showed specimens of live trout and salmon in various stages of development, one from the Atlantic Fisheries Experimental Station at Halifax gave a demonstration of brine freezing, while another placed before the visitors specimens of various kinds of fish taken from inshore and offshore waters. In the latter exhibit were included catfish, monkfish, skate, etc., and these, not being so familiar to the layman as other commercial varieties, which were also shown, were the cause of considerable interest and favourable comment.

The schooner race, open to bona fide vessels of the fishing fleet and sponsored by the Exhibition Committee, was won by the schooner *Margaret K. Smith*.

The Lunenburg Board of Trade and others responsible for the plans for the fair are to be congratulated on the splendid results achieved. The exhibition assumed national importance and received wide publicity. The success attending the first exhibition practically ensures its annual repetition.

BONUS ON HAIR SEALS—DESTRUCTION OF HAIR SEALS

The bonus for the destruction of hair seals was continued in 1929, but the amount paid per seal was reduced to \$2.50 as compared with \$3.50 during the two previous years. The number of hair seals on which a bonus was claimed by fishermen and others was 3,321. These figures do not represent the total number of seals killed in provincial waters as many were destroyed upon which no bounty was claimed, due to the inability of the killers to substantiate their claims. It is estimated that about 10 per cent of the bodies of the seals killed were lost before they could be recovered to secure the snouts which must be presented as evidence of destruction by persons claiming the bounty.

The best killing months of the year were May, June, and July. The month of June was far ahead of all others and 1,706 claims were paid on seals killed. This proved to be the month in which seals were the most prevalent along all sections of the coast. May accounted for 388 seals and July for 475.

The largest number of claims was paid in the eastern section of the mainland, while in the previous year the western section led. The seven eastern counties of the mainland accounted for 1,376 claims, the seven western counties for 1,276, and the island of Cape Breton for 669. There was little or no market for the skins or blubber and the hunter therefore realized, in most cases, only the amount received as bounty.

The total amount expended in the payment of claims was \$8,302.50, distributed as follows:—

Eastern Nova Scotia (mainland).....	\$ 3,440 00
Western Nova Scotia.....	3,190 00
Island of Cape Breton.....	1,672 50

COURSES OF INSTRUCTION

Courses of instruction for fishery officers, with a view to having them qualify to undertake the duties of inspection of fish, and the instruction of

fishermen in fish-curing processes, were held at the Experimental Station from March 6 to May 28. The first course began on March 6 and ended April 16. The second course covered the period from April 17 to May 28. The course was concluded by suitable examinations and tests, and those who qualified are to have their duties enlarged.

The lectures, extremely interesting and covering a number of subjects, were followed very closely by the officers in attendance. It is without question that the information given was highly appreciated by those present at the courses.

UTILIZATION OF FISH WASTE AND MANUFACTURE OF BY-PRODUCTS

During the year three licensed reduction works were engaged in the manufacture of oil on the island of Cape Breton:—

1. Marden Wilde Corporation, North Sydney.
2. Arthena Marie Fish Company, Ingonish Ferry.
3. Leonard Brothers, North Sydney.

In addition to the three plants operated in Eastern Nova Scotia, a new plant was installed at Pictou by Fred Magee Limited for the purpose of manufacturing lobster body meal. The plant was only operated in an experimental way, but a ready market was found for the meal as fox food. The plants operated under licence during the year were as follows:—

1. Robinson Glue Company, Canso.
2. Easterfat Limited, Halifax.
3. C. W. Kendall, Halifax.
4. Fred Magee Limited, Pictou.

Eight plants were operated under licence in Western Nova Scotia, and all were engaged in the manufacture of oil but the Lewis Canning Company, which was engaged in grinding scallop and clam shells into chicken feed. The plants in operation during the year were as follows:—

1. H. R. L. Bill, Lockeport.
2. W. H. Goudey, Port Maitland.
3. Lewis Canning Company, Limited, Annapolis.
4. Roy Casey, Victoria Beach.
5. Parkhurst Cod Liver Oil Corporation, Tiverton.
6. A. W. Dodd Company, Limited, Westport,
7. Arthur Payson, Brooklyn.
8. Lockeport Company, Limited, Lockeport.

RIVER AND INLAND FISHERIES

Particular attention was paid during the year to the river and inland fisheries, as they are not only of great value from a sport fishing point of view but it is quite essential that they receive adequate protection in order to ensure a future supply of fish such as salmon, smelts, alewives, and other anadromous fish for the nets in the tidal portions of the rivers and along the coasts. Many thousands of tourists and native sport fishermen enjoy their recreation in the river and lake fisheries. More and more tourists are being attracted each year to this province on account of the opportunities afforded for sport fishing, and it is realized that their influx means a considerable source of revenue to the province.

It is discouraging to have to report that 1929 was the poorest season experienced on the Margaree river, on the island of Cape Breton, for many years, so far as salmon angling was concerned. The catch was only 274 as compared with 509 in the preceding year. The river was in very poor condition in June,

July, and the early part of August on account of the water being very low, clear, and warm. From the middle of August until the close of the season fairly satisfactory catches were landed. At Little river, Inverness county, the catch for 1929 was 95 fish, as compared with 121 in the previous year.

Trout were plentiful from May to July in the Margaree and its tributaries, and good catches were landed at lake Ainslie from July 15 to September 1. Trout were fairly numerous in North Aspy channel, Clyburn's brook, and Middle river during June. Large catches of magnificent trout were taken at St. Esprit, L'Archeveque and Catalone lake.

On the eastern portion of the mainland, particularly on the St. Mary's river, Guysboro county, and other rivers in that vicinity, salmon fishing was very good, catches being made with the fly as follows:—

	1929	1928
St. Mary's river.....	444	189
Gaspereau brook.....	35	20
Ecum Secum river.....	72	55
Country Harbour river.....	23	15
Isaacs Harbour river.....	40	35

Trout fishing in the eastern mainland portion of the province, particularly Guysboro and Halifax counties, was unusually good, and there seemed to be every indication that the annual stocking from the hatcheries is of great assistance in keeping these waters from becoming depleted, particularly waters in the vicinity of the large centres which are heavily fished. There are numerous streams in the isolated parts of Halifax county, and also Guysboro county, which are in excellent condition, and in which trout abound.

In western Nova Scotia the run of salmon up the LaHave river was particularly good, and anglers met with good success. The catch of salmon with the rod on the Medway and Mersey rivers, Queens county, was somewhat smaller than last year. This cannot be attributed to the decrease in the run of fish, but is due to the fact that the salmon do not take the fly as readily as in previous years.

A great deal of effort was expended by our officers in order to keep the rivers and streams free of obstructions, etc., so that salmon and other fish might have free access to their spawning grounds. Salmon and trout fry were planted in various waters. Fishways were constructed in numerous dams and various obstructions removed from the rivers and streams.

VISIT OF MINISTERS

A tour of the province was made during August by the Hon. P. J. A. Cardin, Minister of Marine and Fisheries; Colonel the Hon. J. L. Ralston, Minister of National Defence; and the Deputy Minister of Fisheries. The principal fishing centres were visited, and the party met the fishermen and discussed problems of the industry with them.

FISHERIES PATROL SERVICE

The *Mildred McColl* patrolled the shores of Halifax and Guysboro counties during January and was laid up on January 31 at H.M.C. Dockyard for a short period during the winter months. Before being again placed in commission the usual annual overhaul was made and she recommenced patrol work on April 15. During April and May and the early part of June she was largely confined to patrol work in Halifax county. During the latter part of June she left on a patrol from Halifax to River Philip, covering the coast waters of Halifax, Guysboro, Canso, Pictou, Colchester, and Cumberland counties. During the remainder

of the year she was largely confined to Halifax and Guysboro counties, with the exception of some work done in Lunenburg county. During the time of her employment she was engaged in preventing illegal lobster fishing, placing buoys showing dividing lines between the different lobster fishing districts, inspecting trap-nets, salmon nets, etc. Captain Williams and his crew were tireless in their efforts, and deserve praise for the efficient patrol carried on.

The *Lulu T.* was again chartered for patrolling the lobster fishing boundary line at Port Philip, Cumberland county, during August, September, and October. She was placed in commission on August 12 and laid up on October 31.

The *F.P. 1* went into commission on June 5 and was in service until December 21, 1929, during which time she patrolled 2,064 miles.

The *F.P. 1* gave a continuous and efficient patrol, destroying 527 traps and liberating 404 lobsters. The boat also salvaged 171 buoys and 2,595 fathoms of rope, which were disposed of by sales.

FISHERIES CRUISER SERVICE

The *Arras* was laid up at Yarmouth during March for annual repair, and was again placed in commission on April 1. The usual patrol was carried on until the middle of June, when the vessel proceeded to the Banks to join the fishing fleet.

Since 1924 the *Arras* has been fitted up as a hospital ship during her stay on the Grand Banks with the fishing fleet, and the services of a medical officer have been engaged. Dr. Webster, who has been employed in this capacity since 1925, has given valuable aid to the fishermen. Each year shows an increase in the number of calls and the number of cases treated. The report submitted by Dr. Webster covering such work during the 1929 season is as follows:—

Total number of new cases.....	335
“ “ calls.....	394
“ “ minor operations.....	43

This shows an increase of 32 over the previous season's figures.

“The outstanding observations,” says Dr. Webster's report, “were the increase of infections of the respiratory tract and the decrease in hand infections, especially of a serious character. It appears that the change in atmospheric conditions when coming to Newfoundland in the spring is the predisposing cause of the respiratory infections among the fishermen. It is hoped that the reduction of hand infections, with their incapacitating and often maiming results, will continue, due to the education of the men in the use of antiseptics and care of these unfortunate conditions when they occur.

“There is a large amount of investigation still to be done in the study of the infection and extensive necrosis following puncture wounds from fish bones. I must again deplore the lack of facilities on the *Arras* for the transportation and accommodation of patients,” Dr. Webster stated in his report. “This will be better appreciated when it is pointed out that one or more patients were on board the ship almost the entire summer. More active work could undoubtedly be carried on if a more seaworthy and speedy craft were placed on the service. I can only refer again to the kind and valuable co-operation of Captain Barkhouse and his officers in the medical work of the ship.”

The *Arras* returned from the Banks in September, and carried on the usual patrol work during the remainder of the year.

The *Arleux*, commanded by Captain Cousins, laid up at Lunenburg for annual repair in the latter part of January, and was ready for sea the first of March.

Excellent service was rendered by the *Arleux* through the year in ice breaking, assisting disabled vessels, patrolling the coast along the Northumberland strait district at the opening of the lobster fishing season, and in acting as a "mother ship" to the winter fishing fleet operating out of Canso and vicinity. Letters of appreciation have been received from time to time expressing satisfaction with the service performed by the *Arleux* in ice breaking, and with the assistance rendered by the vessel to the fishing fleet generally through the year.

LOSS OF LIFE

It is very gratifying that the Supervisor for District No. 1 reports that there was no loss of life amongst the fishermen in his district during the year.

In the eastern section of the mainland, District No. 2 the following fishermen met death by drowning while engaged in their work:—

Murray Henderson, New Harbour, N.S.

Earl Slaunwhite, Terrence Bay, N.S.

Gordon Slaunwhite, Terrence Bay, N.S.

Frank Slaunwhite, Terrence Bay, N.S.

Basil Slaunwhite, Terrence Bay, N.S.

Angus Julian, Grand Desert, N.S.

Spencer McDonald, Harrigan Cove, N.S.

In Western Nova Scotia, District No. 3 the following losses were reported:—

Rover Cleveland, Sr., and Robert Cleveland, Jr. of West Dover, schooner *General Haig*, lost their lives on March 16, 1929, while out attending to trawls.

John Fleet, Blandford, and William Hardy, Rose Blanche, Newfoundland, of the schooner *Mahaska*, lost their lives on March 22, 1929, when their vessel was rammed on the Banks by a French trawler.

Hilbert Bezanson, Dr. Kingsburg, schooner *Marion Elizabeth*, drowned while the schooner was at Canso for bait, August 10, 1929.

John Leary, Kingsbury, schooner *W. E. Knock*, was knocked overboard by the ship's boom, September, 1929 and drowned.

George Pyke and William Peddle, St. Mary's, Newfoundland, schooner *C. A. Anderson* were lost from their dory while attending trawls, July 9, 1929.

NEW DEVELOPMENTS

Among the outstanding developments indicative of progress in the fisheries during the year, were the construction by the fishermen of a considerable number of new boats and the enlargement and improvement of plants by several companies and firms. A new company was established on the south shore and now has one of the most up-to-date plants in Nova Scotia handling all kinds of ground fish and employing a large number of men. Installation of a canning plant for the purpose of putting on the market canned fish cakes, canned fish chowder and other canned products was carried out by one of the previously established companies. Installation of a new cold storage plant was begun by another firm and there was enlargement and improvement of an existing cold storage plant in another case. The latter company also completed the establishment of a fish meal plant. One of the larger operators installed a brine freezer for the production of rapid frozen fillets which can be turned out from the plant at the rate of about 800 pounds an hour.

Development of the use of eel-grass in the production of insulating material was also to be noted during the year. A factory for utilizing the eel-grass was operated in Pictou county producing insulating building blanket. Fishermen gathering eel-grass receive from \$14 to \$15 a ton f.o.b. shipping point.

LICENCES ISSUED

Licences issued during the year were as follows:—

Lobster fishing.....	8, 113
Lobster packing.....	115
Lobster packing (extension).....	119
Lobster pound.....	20
Salmon gill-net, or drift-net.....	693
Salmon trap-net, pound-net or weir.....	478
Salmon net permits.....	43
Smelt gill-net.....	506
Smelt bag-net.....	288
Herring weir.....	75
Drag seine.....	147
Oyster.....	228
Scallop.....	104
Reduction works.....	15
Trap-net.....	271
Cannery.....	20
Shad gill-net or drift-net.....	8
Quahaug.....	1
Angling permits.....	1, 115
Certificates F. 12.....	285

PROSECUTIONS

During the year there were fifty prosecutions for violations of the Fisheries Regulations. Five took place in District No. 1, thirty-one in District No. 2, and fourteen in District No. 3. Statements showing details in connection with the prosecutions referred to are included in appendix No. .

REPORT OF SUPERVISOR J. F. CALDER, DISTRICT No. 1, NEW BRUNSWICK, FOR 1929-30

District No. 1, New Brunswick, is made up of Charlotte, St. John, and Albert counties, and the bay of Fundy watershed of Westmorland county.

The following statement shows the catches of fish and their marketed values in the district for 1929:—

		Catch	Marketed Value
			\$
Cod.....	cwt.	19, 601	50, 078
Haddock.....	"	26, 164	61, 755
Hake.....	"	115, 623	135, 287
Pollock.....	"	8, 466	19, 774
Halibut.....	"	57	767
Flounders.....	"	861	1, 837
Skate.....	"	79	98
Herring.....	"	205, 505	232, 822
Sardines.....	brl.	249, 156	1, 700, 789
Alewives.....	cwt.	32, 820	50, 420
Dulse.....	"	7, 700	10, 020
Salmon.....	"	3, 025	75, 100
Shad.....	"	2, 261	21, 380
Smelts.....	"	168	2, 400
Sea urchins.....	"	54	132
Clams.....	brl.	22, 946	112, 539
Cockles.....	cwt.	350	936
Lobsters.....	"	6, 774	219, 557
Scallops.....	gal.	950	1, 600
Winkles.....	cwt.	103	429
Hake sounds.....	"	821	4, 353
Fish livers.....	buckets	35, 534	19, 124
Fish oil.....	gal.	41, 183	26, 063
Herring oil, including waste oil from sardine canneries.....	gal.	91, 420	22, 446
Herring meal.....	tons	701	29, 923
Fish fertilizer.....	"	428	4, 760
Herring scales.....	cwt.	1, 694	5, 652
Fish skins and bones.....	"	100	202
Hair seals.....	"	161	161
Total.....			2, 810, 404

The marketed value for 1929 was \$2,810,404, as against \$2,138,860 for 1928, an increase of \$671,544. This increase, however, was, in a large measure, due to the greatly increased sardine canning output at Black's harbour; therefore, it reflects abundant prosperity in a particular line rather than in the industry generally. At the same time, while the increased market value of sardines amounted to \$416,018, the value of the output of the other branches shows a substantial increase of \$255,526.

COD

There was a slight falling off of the catch of cod as compared with the previous year, 19,601 hundredweights being taken in 1929, as against 22,158 hundredweights in 1928. A corresponding decrease is to be noted in the marketed value of the product, \$50,078 for 1929 and \$63,917 for 1928. Most of the cod were sold in a fresh condition, and shipped out as whole fish.

HADDOCK

There was a slight decrease in the haddock catch, 26,164 hundredweights being taken in 1929, as against 28,164 hundredweights for 1928. The total value of the catch was \$61,755 as against \$63,110 in the previous year. Most of the haddock in this district are sold fresh and shipped out in that condition, and as whole fish. While there was only a slight falling off in the catch, these fish were not nearly as plentiful during the fall months as they were during the same period in previous years; there was a considerable increase in the number of boats engaged in haddocking during the past fall, but the year's catch showed a decrease.

HAKE

A tremendous increase is to be noticed in the catch of hake for the year—115,623 hundredweights, as against 68,160 hundredweights for 1928, and 36,796 hundredweights for 1927. There was a phenomenal run of hake in the bay of Fundy waters of the district during the summer. It was a common daily occurrence for the boats to come in from the fishing grounds completely loaded, with daily catches for the single boat running from 4,000 to 10,000 pounds. Unfortunately, however, as these fish are all split and salted for the export dried fish trade, a very low price is paid to the fishermen for them. None of the fishermen cure their own catches. The amount received by the fishermen for the catch was \$70,596, about 61 cents per hundredweight. The total marketed value of the product, however, was \$135,287; but, of course, that also represents the labour that was performed in dressing, curing and drying, cost of salt, the dealers' profits, etc. It is regrettable that the entire district catch of hake has to be disposed of in this manner. They are all taken during the summer months when they are fat and in prime condition, and would make splendid fillets. It may be of interest to point out that the catch of hake from this district was about two-thirds of the catch for the whole province of Nova Scotia for 1928, but while Nova Scotia marketed 18,451 hundredweights fresh for \$23,396, and 1,356 hundredweights fresh fillets for \$12,830, and 2,984 hundredweights smoked fillets for \$32,534 and 1,603 hundredweights boneless for \$13,662, the entire catch in this district was disposed of either green-salted or dried.

POLLOCK

A very serious decline is to be noticed in the catch of pollock for the year, 8,466 hundredweights, as against 34,118 hundredweights for 1928. The catch for 1927, however, was only 7,693 hundredweights. The marketed value of the catch

for 1929 was \$19,774. There was no summer catch in 1929 and only a very light catch around the islands of Charlotte county in the fall. What few fish there were, were very large and fat. They were all slack-salted and dried and sold for fancy prices. Fifty-five cents per bucket was paid for pollock livers. The liver of the individual fish brought more than five cents.

FLOUNDERS

A very small quantity of flounders was taken, 861 hundredweights, with a value of \$1,837. They were captured with spears and hook-nets. In the adjacent waters along the coast of the state of Maine, as elsewhere on the Atlantic Seaboard of the United States, flounder-dragging is permitted. Local fishermen, of course, have knowledge of the success of this fishery in United States waters and have been anxious to have it permitted here. An order in council recently issued permits the operation of small draggers, and, no doubt, there will be a number operating next fall.

HERRING

There was a considerable increase in the herring catch for 1929 as compared with 1928. In the former year 205,505 hundredweights, with a marketed value of \$232,822, were taken, as against 160,312 hundredweights, with a marketed value of \$223,283, for 1929. The herring fishery of this district is largely centered in the smoked herring industry of Grand Manan island. There was a fair catch during the year and very good prices were obtained, with the result that the fishermen engaged had a fairly successful season.

SARDINES

A slight decrease took place in the 1929 catch of sardines as compared with last year—249,156 barrels for 1929 and 279,349 barrels for 1928. There was a large increase, however, in the marketed value of the 1929 product as compared with that of 1928. The marketed value of the 1929 output was \$1,700,789, as against \$1,284,771 for 1928. This increase in value is, in a large measure, due to the enormous pack of canned sardines at Blacks' harbour where the output was about 330,000 cases. The largest producers paid the fishermen \$10 per hogshead for all sardine herring bought by them throughout the whole season, while the canneries on the American side of the line were paying only \$5 per per hogshead. The amount paid the fishermen of the district for their sardine catch during the year was \$363,804, as against \$349,555 during 1928, although the catch in 1928 was 30,000 barrels greater than that of 1929.

SALMON

A considerable increase is to be noticed in the salmon catch for the year, the landings being 3,025 hundredweights, with a value of \$75,100, as against 2,500 hundredweights with a value of \$56,051 during 1928.

It is very gratifying to note that the commercial salmon fishery of the district is well holding its own, and, as a matter of fact, has increased somewhat during the past twenty years. The increase in the catch cannot be attributed to improved methods of fishing, for there are no more boats and no more nets, nor longer nets operating now than were operating twenty years ago. From time to time, critics, whose information is limited to some particular locality, raise the cry that our salmon are being exterminated. Not only are the yearly catches made by the commercial fishermen of this district a complete refutation of such an assertion, but the increasingly large number of salmon that are each year finding their way to the head waters of the rivers and streams which empty into

the bay of Fundy, for the purpose of reproduction, is in itself eloquent testimony to the fact that the salmon fishery of this district is in a very healthy and satisfactory condition.

During the past summer the Department completed the fishway over the natural falls on the Magaguadavic river at the town of St. George. It is confidently expected that as a result of this fishway, a splendid sport fishery will be established on the Magaguadavic.

ALEWIVES

The alewives catch for 1929 was considerably greater than that of 1928. The catch for 1929 was 32,820 hundredweights, with a marketed value of \$50,420, while the catch of 1928 was 21,505 hundredweights, with a marketed value of \$35,280.

Outside of the increase in the catch for the year, there is very little to note in connection with the fishery. Most of these fish are salted, barrelled and exported to the West Indies. Owing to unfavourable business conditions in the islands where the alewives are sold, the demand has been very poor and prices low.

SHAD

In the shad fishery during the year the catch was 2,261 hundredweights with a marketed value of \$21,380, compared with 2,388 hundredweights and a marketed value of \$27,861 in the previous year. An encouraging feature in connection with this fishery, however, is the large run of spawn shad which have again successfully ascended the Petitcodiac river. Inspector Barnes is very diligent in protecting these fish while they are on the spawning ground. He has a force of guardians under him who maintain a continuous patrol of the river all the time the fish are there. Very beneficial results to the fishery may confidently be expected to result from such protection.

LOBSTERS

A decrease occurred in the catch of lobsters for 1929 as compared with the year before—6,774 cwt. in 1929, as against 7,177 cwt. in 1928. Owing to better prices, however, the fishermen received \$219,557 for the 1929 catch as against \$149,537 for that of 1928.

FISH WASTE, FISH LIVERS, FISH OIL, HERRING OIL, HERRING MEAL AND FISH

FERTILIZER

It may be of interest to point out that during the year over \$100,000 was received from the sale of fish livers, fish oil, herring oil, herring meal and fish fertilizer, detailed as follows:—

Fish livers.....	35,543	buckets,	marketed	value	\$ 19,124
Fish oil.....	41,183	gallons	"	"	26,063
Herring oil.....	91,420	"	"	"	22,446
Herring meal.....	701	tons	"	"	29,923
Fish fertilizer.....	428	"	"	"	4,760

Total valuation of these by-products.....\$102,316

Both the quantity of fish livers and fish oil may appear to be large, considering the catch of fish, but the figures are correct. A person who is not familiar with certain phases of the fish business might wonder why fish caught in this section should have larger livers and produce more oil than those which may be taken elsewhere. The answer is quite obvious; the lower stretches of the bay of Fundy are excellent feeding grounds for fish; there is practically no winter line fishery; the catches are all made during the summer and fall months, when the fish are very fat and contain very large livers.

Attention may well be called, however, to the enormous quantity of fish waste which is yearly thrown away, and which ought to be converted into fish meal, fish fertilizer and oil. The enormous quantity of 4,000,000 pounds was thrown away during the past year. This, surely, constitutes a terrible economic loss to the industry.

CLAMS

A slight improvement is to be noted in the clam industry during the past year as compared with 1928. A few more barrels were taken in 1928 than in 1929, the figures being 23,121 barrels for 1928, as against 22,946 barrels for 1929, but the marketed value of the 1929 output was \$112,539 as against \$96,383 in 1928.

Practically all of the clams are canned—most of them on the New Brunswick side of the international boundary line.

MINOR BRANCHES

There is very little to note in connection with the minor branches of the industry, such as the gathering and drying of dulse, the scallop fishery, and the saving of herring scales. Only a very limited amount of business was done in these branches.

CO-OPERATIVES

There is only one fishermen's co-operative association in this district, the Grand Manan Smoked Herring Co-operative Association. As the name implies, the activities of the co-operative are confined altogether to the smoked herring business, both in marketing the product and in the purchase of certain supplies, such as salt and herring box-shooks. The association handles about 95 per cent of the smoked herring output from Grand Manan island, and marketed over \$150,000 worth of the product during the year.

This co-operative association has been of great benefit to the smoked herring industry of Grand Manan. For a few years previous to its organization, the smoked herring business was in a demoralized condition, in so far as marketing conditions were concerned. The object of all appeared to be to dispose of their stocks as quickly as possible, no matter what the returns might be. This unfair competition and price-cutting had the obvious result of producing little, if any, profits to anyone concerned.

The co-operative adopted the plan of regulating the export of the product from the island, sending to the markets, at all times, such quantities as they could fairly well assimilate. The old policy of dumping all the goods on the market at the one time was superseded by a new order of regulated marketing. The operations of the association have been successful from the first, and have been the means of putting hundreds of thousands of dollars in the pockets of the Grand Manan fishermen. The chief market for their product has been in Haiti; but, owing to poor business conditions there, as well as political disturbances, the demand during the past year or more was unfortunately very light.

The herring are smoked principally during the months of August, September and October. They are thoroughly well salted and smoked and, under ordinary conditions, can be held over for a whole year. This is what the co-operative is striving to do, but with the slow sales of the present time, the problem of financing the co-operative so that the goods can be held over is a very serious one. At the request of the directors of the co-operative the supervisor for the district attended a general meeting of the association last summer and later presented their representations to the Department. Later in the season he accompanied the Deputy Minister to another meeting of the association.

REMARKS

On the whole, there was an improvement in the fishing industry in the district as compared with the few previous years. This is reflected in a new spirit of hopefulness and co-operation among the fishermen. During the summer, prominent fishermen, and persons connected with the industry at Deer island, organized a Board of Trade as a means of promoting the commercial welfare of the section. Early in the fall, a Board of Trade was also organized on Campobello island, with headquarters at Wilson's beach. The latter organization, among its other activities, has taken up the matter of the resuscitation of the Charlotte County Fish Fair Association, which was probably, for many years, the first and only purely fish fair in the Maritime Provinces. The exhibition will be held at Wilson's beach early in September. On the invitation of the Campobello Island Board of Trade, Dr. M. M. Coady, Promoter of Fisheries Organization for the Fisheries Branch, delivered a very able and interesting address before a banquet held by that body, in connection with the meeting of the organization of fishermen's associations.

Unfortunately, some few localities such as Deer island and the Lepreau section, had very poor runs of sardine herring, which is their principal fishery, and did very poorly. On the other hand, line fishing centers like Wilson's beach, Beaver harbour and North head, did very much better than they had done for a number of years past. More new boats, and bigger and better boats, were built at Wilson's beach last winter than during any other winter for the past eight or ten years.

The great drawback of this section is in the methods of curing and marketing the fish. Cod and haddock are shipped out in a fresh condition as whole fish, while the hake, pollock and a portion of the cod are split and salted and then shipped out either green-salted or sun-dried. Very little labour is employed in such operations. There is a wonderful opportunity here for a great development in the fishing industry, provided the necessary steps are taken to organize it along modern lines and instal a chain of rapid-freezing, filleting, finnan-haddie, mild-curing establishments. This, of course, would not only put more money directly into the pockets of the fishermen, but it would also provide employment for the surplus shore population.

The following tables cover licences, certificates and prosecutions during the year:—

Kind of Licence	Number
Herring weir.....	650
Lobster fishing.....	414
Lobster pounds.....	7
Permits to dig clams.....	95
Cannery.....	11
Salmon drift-net.....	95
Shad gill-net.....	47
Seine permits.....	7
Reduction works.....	4
Scallop.....	20
Confiscations.....	64
Prosecutions.....	12

REPORT OF SUPERVISOR A. L. BARRY, DISTRICT NO. 2, NEW BRUNSWICK, FOR 1929-30

District No. 2 embraces the fishing in the rivers and coastal waters of the five eastern counties of New Brunswick—Westmorland (Northumberland strait side only), Kent, Northumberland (except the Northwest and Southwest Miramichi), Gloucester and Restigouche. The value of all the fisheries for the calendar year 1929 was \$228,376 more than for the previous year. The follow-

ing table shows the catch and landed value of the different fisheries for 1929 and 1928 respectively:—

	1929		1928	
	Catch	Landed Value	Catch	Landed Value
	cwt.	\$	cwt.	\$
Lobsters.....	75,946	641,051	50,793	487,321
Smelts.....	47,238	493,454	59,502	572,779
Salmon.....	13,865	213,495	9,472	135,532
Cod.....	176,618	314,655	150,704	243,420
Oysters.....	13,636	79,027	12,383	81,823
Tomcods.....	22,554	38,808	17,266	25,044
Herring.....	239,504	130,607	175,512	98,063
Clams and quahaugs.....	5,137	7,584	6,937	10,752
Mackerel.....	13,529	25,287	18,611	34,780
Alewives.....	5,160	2,670	665	445
Hake.....	11,404	8,354	10,566	11,363
Haddock.....	1,457	2,018	714	1,492
Shad.....	1,487	4,135	3,718	11,974
Flounders.....	23	42	.....	.....
Trout.....	97	1,940	88	1,760
Bass.....	128	1,713	201	2,179
Eels.....	104	684	320	1,926
Mixed fish.....	107	107	96	106
Hair seals.....	692	1,730	795	1,988
Halibut.....	142	1,116	.....	.....
		1,949,135	.....	1,720,759

Lobsters.—It is most gratifying to be able to report a very great increase in the catch of lobsters, amounting to over 25,000 cwt. This increase may be attributed to the fair weather for fishing throughout the season and the cessation of illegal fishing in the close season which, three or four years ago, undoubtedly accounted for a great deal of the catch of which there was no record in the annual statistics. In 1929 there were packed 27,763 cases, as compared with 19,478 in the previous year, an increase of over 8,200 cases. There was also a considerable increase in the “shipped in shell”. Owing to the respect for the close season and the interest taken by the fishermen in the protection of the berried lobsters, there does not seem to be any need for worry about the future of this industry. One hundred and eleven canneries were operated in comparison with 113 in the year 1928.

Smelts.—There was a decrease of somewhat over 12,000 cwt. in the catch of this fishery. This is explained largely by the fact that very few smelts were taken at the opening of the season on November 25 of last year. One explanation given by the fishermen is that there was no heavy easterly storms during the fall to drive the fish food on the shore; consequently, as the smelts found their food well off shore, they did not feel any necessity of coming into the rivers and harbours of New Brunswick. This is somewhat borne out by the report that large quantities of smelts were to be found around the Magdalen Islands. However, the decrease is only the ordinary fluctuation from year to year and need cause no uneasiness with respect to the future of this part of the fishing industry. Dealers report that it is just as well that a big catch was not taken, for, if such had been the case, the price of smelts would have had to drop, owing to the stocks carried over from the previous year and held in cold storage in United States. Prices during the fall average about twelve cents per pound. The quality of the smelts was not as good as in 1928-29, but yearly variation of this kind is not unusual. Considerable loss was caused the fishermen in Miramichi bay owing to the breaking away of large fields of ice which carried fishing rigging with them.

Salmon.—The yearly report of 1928 showed the salmon fishery as being the poorest catch in many years, or about 50 per cent of the 1927 catch and amounting to only 9,472 cwt. In 1929 this increased to 13,865, a considerable increase, but the catch is still below normal. Good prices were paid, however, which tended to equalize the situation somewhat. In the bay Chaleur and Restigouche waters, the catch was even below that of 1928, but this was due to the fact that the fishermen in that area, who generally cease fishing about July 20, missed an enormous run, locally called the "St. Anne run," which struck in Northumberland strait and bay Chaleur during the first week of August. Some of the trap-net fishermen of the Miramichi got practically their summer's catch out of this tremendous run and there is no doubt that had the Restigouche and bay Chaleur fishermen been fishing they would also have benefited. As the drift-net fishing in Northumberland strait ended on July 31, all of this catch was taken by the set-net fishermen, which made up to them, in a great measure, for the poor catch which they had experienced during the previous two months. The fall run of salmon, commencing early in September, was the largest reported along the shores in many years. All streams were teeming with salmon, many of them brooks which never before were seen to have more than a stray salmon or two in them.

The grilse run was also the largest in many years. It started about June 15, and kept up until along in September, a condition not previously recorded. Usually, the grilse run starts about the second week in July and lasts for about three weeks at the most. These two factors, the enormous fall run of salmon and the heavy and prolonged run of grilse, would seem to portend splendid salmon fishing in 1931. In spite of the heavy fall run of salmon and the good price there was very little illegal fishing during the close season, owing to the strict check kept on the localities where illegal fishing generally occurred and to the fact that a close check was kept on the shipping points.

Throughout the summer complaints were received from fishermen all over the district about a condition of the salmon. Many were observed to have white spots on the back of the head, varying in size from a 5 cent piece to a 25 cent piece. In these cases there were bruises around the head and, in a few instances, one eye was missing. The spot on the head is explained as a parasitic growth. One explanation of the bruises is that the irritation from the growth caused the salmon to knock its head against obstructions. Many fish had to be culled on account of this injury.

Cod.—There was an increase of about 26,000 cwt. in cod catch over the previous year, accounted for chiefly by the open fall which permitted fishing right into November. The price for dried cod was the best for many years, running as high as \$10.50 per quintal for the equivalent of No. 1 Gaspe cured.

Following up a start made the year before, an instructor and demonstrator in cod splitting and drying was employed in Gloucester country throughout the summer and fall. The result of his work the year before, and the high prices commanded by fish packed under his supervision, created an immense interest among the shore fishermen. The Caraquet fleet, however, consisting of about 125 vessels, did not desire the instructor's services, but it was gratifying to note, in the fall, when the dried fish were being bought and graded by the buyers, that many of these vessel fishermen changed their opinions. The fleet have asked that an instructor be sent with them during the season of 1930.

Oysters.—There was an increase of 1,300 barrels over the previous year in oyster landings but the value was not as great. The market was reported rather slack, due to the ungraded quality of oysters which had to compete with the graded stock from United States. Two new areas for prospective leases on

barren bottoms were staked out by fishermen. The main difficulty in connection with leases seems to be the lack of capital necessary to build up the bottom with gravel and shells and the procuring of small oysters for seed.

Tomcods.—There was an increase of over 5,000 hundredweights in tomcod catch, with a corresponding increase in value. This is accounted for by the fact that the smelt fishing season opened on November 25 last year and allowed for the taking of a very heavy run of tomcods on their way up the rivers to spawn. Usually the bulk of the catch in this fishery is taken from about January 25 to February 15 but such was not the case last year. During February, 1929, the market was so poor that the fishermen, being unable to sell their catch, ceased fishing before the close of the season. As these fish are only worth \$1 to \$1.50 per barrel the lack of the market did not create any great difficulty.

Clams and Quahaugs.—There was a decrease of 1,800 barrels with a corresponding decrease in the landed value, due in part to the fewer fishermen engaging in the industry. Six canneries were operated for the packing of these shellfish.

Mackerel.—There was a splendid run of these fish and the quality was excellent. The decrease in catch is explained by the poor market.

Alewives.—Although the market was still off on alewives there was a very great increase in the catch over 1928, which showed the poorest in many years.

Hake and Cusk.—This fishing showed a slight increase in catch. Conditions for fishing were good.

Haddock.—The haddock catch was about double that of 1928, but the landed value fell off somewhat.

Shad.—Most of the shad taken are caught by salmon nets and the run lasts for about two weeks. The 1929 catch was less than 50 per cent of that of 1928 and the proportionate value was not as large as that of last year.

Trout.—The trout catch remained about the same as in the previous year and the value was proportionately the same.

Bass.—There was a decrease of 73 hundredweights for which no explanation is known.

Eels.—The catch of eels was about one-third of that of the previous year. This is not an important fishery in this district so the decrease in catch did not create any hardship.

Halibut.—This is the first year that this fishing figured in the statistics of district No. 2; 142 hundredweights were taken, mainly in the Caraquet district.

Hair Seals.—Bounties of \$1,732.50 were paid for 693 seal noses compared to \$1,988 for 795 noses in 1928. It would seem that these animals are getting scarcer. In 1928 the payment of bounties had to be stopped in mid-summer owing to the appropriation being all expended. Last year, while there was money available for bounties, it was not all taken up. There were not so many complaints about salmon being destroyed by hair seals, hence it would seem the bounty system for hair seal extermination is proving effective.

ANGLING

Good trout and salmon angling was reported throughout the year. Grilse were particularly plentiful and provided good sport for many fly fishermen.

PROTECTION

A much better sentiment prevails among the fishermen of the district with respect to proper protection of the different fisheries. During the past three or four years very strict enforcement of the fishery laws has been maintained by an efficient staff of guardians backed up by three patrol boats which were stationed at centres which previously gave trouble. When the boats were first employed some fishermen showed considerable resentment at their activities, and gave the crews very little support. Last year, however, they seemed to consider these patrol boat crews as friends, placed there to give them protection and not to persecute. Much information was passed along to the boat crews by the fishermen themselves. The splendid lobster catch of last year is credited by the fishermen to the activities of the patrol boats during the previous two years.

CONFISCATIONS AND PROSECUTIONS

The activity of the officers and guardians and of the patrol boats is shown in the number of confiscations, there being forty-one more than in 1928. Sale of confiscated property amounted to \$539.60.

There were thirty-eight prosecutions during the year compared with fifty-four in the year before. They were for offences as follows:—

Breach of lobster regulations.....	13
Breach of oyster regulations.....	3
Breach of salmon regulations.....	19
Breach of smelt regulations.....	3

Fines during the year amounted to \$368, exclusive of costs.

EDUCATIONAL WORK

As a result of the course given at the Fisheries Experimental Station, Halifax, early last year the officers who attended were able to give much good advice to the fishermen as to improved methods of caring for and curing their fish. The fishermen, on the whole, seem in a receptive frame of mind to receive instruction. This was particularly noted in the cod fishery where many fishermen, who formerly did not take the trouble to do so, now bleed their fish when caught. Instruction has been given also in the pickling of herring and mackerel, with good results. Owing to the many duties of the inspectors, they cannot give the fishermen as much time as is desired for work of this kind, and it is hoped that an increase in the number of specialists in education may be possible.

BRINE FREEZING

A new plant, put up at Richibucto last summer for the making of brine frozen fillets, will be equipped and ready to carry on this year. This should prove a great boon to the village, which, on account of being off the main line of communication, was in the past not able to dispose of its catch of fresh cod or haddock advantageously.

FISHERIES ORGANIZATION

Within the past three or four years four organizations for fishermen have been started in this district, namely, the Restigouche Salmon Fishermen's Association, the Gloucester Fishermen's Association, the Alnwick Fishermen's Association, and the Hardwicke Fishermen's Association.

These organizations are getting ready to enter the larger organization of the Maritime Fishermen's Association now in process of being formed. So far their activities have been confined to a body that could speak as one voice to the department in matters respecting the different fisheries of their respective districts.

LICENCES

During the year 9,929 licences were issued as compared with 10,360 in 1928. The 1929 total was made up as follows:—

Smelt bag-net licences.....	5,940
Smelt gill-net licences.....	290
Oyster fishery licences.....	964
Bass fishery licences.....	56
Lobster fishery licences.....	1,834
Salmon trap-net licences.....	391
Lobster pound licences.....	6
Cannery licences.....	6
Gaspereau fishing licences.....	51
Lobster packing licences.....	111
Lobster packing extension licences.....	67
Quahaug fishing licences.....	76
Salmon drift-net licences.....	136
Herring weir licences.....	1
	<hr/>
	9,929

REPORT OF SUPERVISOR H. E. HARRISON, DISTRICT No. 3, NEW BRUNSWICK, FOR
THE YEAR, 1929-30

District No. 3, New Brunswick, includes the counties of Kings, Queens, Sunbury, York, Carleton, Victoria, Madawaska and the non-tidal waters of the Northwest and Southwest Miramichi rivers in Northumberland county.

In the calendar year 1929 the fishermen had a fairly satisfactory season generally. On March 2, a newspaper of St. John reported the first river-caught gaspereau on sale in that market, but it was not until April 19 that this fish was reported being taken in this district, at Gagetown, and on April 25, a good salmon was taken in the St. John river above Fredericton. The first shad reported was at Gagetown on May 20. The earliest freshet was not as high as usual but the weather turned wet and disagreeable and on May 6th the St. John river was at its highest for the season, and then fell away fast. Conditions were very similar in the Miramichi district. Shad and gaspereau were running into the Miramichi river in large numbers by June 4th.

The total weight, and value to fishermen, of the catches of commercial fish for the years 1928 and 1929 are as follows:—

1928.....	5,938 cwt.	\$36,176
1929.....	10,845 "	51,929

The marketed value in 1929 was \$56,177 as against a value of \$37,835 in 1928, an increase of \$18,342. The only class of fish in this district showing a difference in value, as between that to the fishermen and as marketed, is the salmon of the Miramichi river area, which showed an added value of \$4,248. The individual catches and values were as follows:—

ALEWIVES

1928.....	1,988 cwt.	\$ 3,589
1929.....	6,280 "	10,355

Prospects of a better market for alewives was the reason for fishermen in the Miramichi area making greater efforts to take a fairly large quantity in 1929, and the fact that men had been trained to make inspection of pickled fish no doubt encouraged dealers to have greater faith in the output.

Price was not very satisfactory, either to fishermen or to dealer, but a market, even at a low price, meant the distribution of considerable money

throughout the area and the fishermen prepared to take advantage of it. It will be observed that the increase was 4,292 hundredweights and only two hundredweights of that was in the St. John river area. Considerable expansion could, and would, be made in the latter area if a paying price could be assured, and a considerable expansion still could be made in the Miramichi river area. Nineteen twenty-seven produced 9,144 hundredweights, nearly all in the latter area. Alewives were in fine condition in 1929 and there appeared to be enormous quantities in the rivers. Only the lack of an assured market, at a fair price, keeps the quantity taken as low as it is. The quality of this fish should not deteriorate greatly in the short time it takes it to reach the fishing areas of the St. John river, after coming through the cold water of the bay of Fundy.

BASS

No bass were reported from the Miramichi area and only eight hundredweights in the St. John river area in the past year. Sea bass ascend the St. John river at least ninety miles and an occasional one is taken in salmon nets. I saw one during the summer of 1929 that weighed 36½ pounds.

EELS

1928.....	420 cwt.	\$ 1,800
1929.....	140 "	450

A decrease of 280 hundredweights in catch and \$1,350 in the value of eels, as between 1928 and 1929 was shown. Both weight and value in 1929 were down to approximately what they were in 1927. A proportionate decrease is shown in both the Miramichi and St. John river waters. Salmon and shad fishermen in the St. John river area would be pleased if eels should vanish altogether from the waters as they are destructive on those fish, when nets are set and fixed to pickets.

MULLET

1928.....	365 cwt.	\$ 1,095
1929.....	284 "	852

A decrease of 81 hundredweights in catch and \$243 in value was shown in the mullet fishery in 1929. Possibly this had something to do with the decreased catch of eels, as mullets are used largely as bait for eel pots.

PICKEREL

1928.....	450 cwt.	\$ 5,850
1929.....	333 "	4,259

The pickerel fishery fell off considerably in both weight and value in 1929. During the season fishermen said that the water was too low and stagnant for good pickerel fishing. An occasional rain and rise in the water stirs this fish up and makes better fishing. The lesser catch probably means more breeders left, and possibly better fishing in 1930. It will be noted that no pickerel are taken in the Miramichi waters. The reason would be interesting to know.

SALMON

1928.....	585 cwt.	\$ 12,603
1929.....	1,130 "	25,271

An increase of nearly 100 per cent in the quantity of salmon taken in 1929, and a more than 100 per cent increase in value, should be quite satisfactory. While every sub-district showed an increase some of the sub-divisions are not good salmon fishing areas at any time. Those sub-divisions usually counted on for fair-to-good catches show a most gratifying return. The Miramichi river area shows an exact 100 per cent increase in 1929 over the year 1928 and 1927, but the periods in which salmon were taken in the trap-nets shows a marked difference. In 1928 the catch for the months of June and July was 187 hundred weights and for August it was 50 hundred weights, while in 1929 the catch for the months of June and July was 127 hundredweights and in August it was 344 hundredweights. During the 1929 fishing season the rivers remained low for a considerable period but some salmon and a large number of grilse ascended both the Northwest and Southwest rivers and some of their tributaries. Then, early in August, immense numbers of salmon came in. In 1928 the rivers were fairly high during June and salmon came in in fairly large numbers that month. Reports from the local officers in the St. John river area indicated that salmon were running in large numbers and the 1929 season was the best in many years, producing 658 hundredweights, at a value of \$16,775 to fishermen. In looking back over a period of eleven years it is found that the nearest to that amount was in 1921, when 575 hundredweights were taken, and the lowest amount in that period was 355 hundredweights in 1923. Analyzing the sub-district catches it is seen that in 1929 the lower St. John river area considerably more than doubled the 1928 catch. York county, in the central area, part tidal and part non-tidal water, produced 83 hundredweights more than in 1928, while Carleton county, all non-tidal water, produced practically double the amount taken in 1928. This is an excellent showing, and one that did not appear to affect the success the anglers had last season in York, Carleton and Victoria counties, as the catches of salmon by anglers was 153 hundredweights, as against 87 hundredweights in 1928.

SHAD

1928.....	2,015 cwt.	\$ 8,056
1929.....	2,616 "	9,545

A betterment of 601 hundredweights of shad over the 1928 catch is shown, and an increase of more than 150 per cent over the quantity taken in 1927. The increase is made by greater catches in Overseer Bell's sub-district, St. John river area, and in Overseer Parks' sub-district, Miramichi river area, and largely in the latter; the St. John river area showed an increase of 73 hundredweights in 1929. Considering the quantity of shad taken, the financial return to fishermen is comparatively small. In the St. John river area the value is only from \$6 to \$9 per hundredweight and in the Miramichi river area the local officer gives it as only \$2 per hundredweight, less than the price paid for mullets used for baiting eel pots. The Washademoak lake area again was the high spot in the St. John river area, and a good many shad reached the upper part of the St. John river (Grand Falls).

STURGEON

1928.....	67 cwt.	\$ 2,345
1929.....	29 "	725

The sturgeon fishery fell back to about where it was in 1927. No particular reason for this condition is known.

DOMESTIC FISHERIES

1928.....	710 cwt.	\$ 12,830
1929.....	736 "	13,845

A reported betterment in 1929 of 26 hundredweights and \$1,015 in value took place in the domestic fisheries. The combined approximate weight and value of the commercial and domestic fish taken in this district in 1929 were 11,581 hundredweights and \$65,774, not a bad showing for a wholly inland area, with many, and large, nets taking their toll outside. The value of materials used by anglers is valued at, approximately, \$19,620 in 1929, and the combined values—commercial and domestic—is placed at \$48,566. In the Miramichi river area the approximate quantity of salmon taken by anglers is 120 hundredweights and 55 hundredweights of trout in 1929, and in 1928 it was 119 hundredweights of salmon and 90 hundredweights of trout. The salmon are very largely young fish; small grilse, not much larger than the trout taken; mostly sea-trout, on the average, with a fairly large salmon caught at odd times. I saw one salmon weighing 37 pounds taken by an angler on the North Branch of the Southwest Miramichi river last season. That was an exceptionally large fish; larger than any I ever saw come out of the St. John river, I think, and salmon in the latter river average considerably larger than the fish in the Miramichi water. The quantity of salmon taken by anglers on the Miramichi is not large when one considers the expanse of that great river and its many tributaries frequented by this fish. New sporting camps are being erected along those waters each season and harder fishing will be carried on year after year, so long as salmon ascend them. A deal of money is left there by non-resident anglers and much more would be left if salmon came in in greater numbers. Practically every mile of the river (the Southwest) is open to any person to fish who is willing to spend a few dollars for guides, food, and camp comforts. Regarding salmon angling on the St. John river and its tributary, the Tobique, it gives very great satisfaction to be able to report conditions much better than those of 1928. The local officers report the quantity of salmon taken by anglers as being double that of 1928, approximately 65 hundredweights in that season and 130 hundredweights in the 1929 season, 70 hundredweights of that amount being taken on the Tobique river. A very large proportion of salmon taken on the St. John river were undersized fish, running about six pounds to the fish. This is somewhat unusual, the average usually being about 10 pounds. The anglers complained that the large fish would not rise to the fly, or, rising, usually escaped—the reference is to the salmon pool at Hartt's island. Very similar conditions prevailed at the pool at the mouth of the Becaguimac river, at Hartland, Carleton county, while in the vicinity of the mouth of the Tobique and in the outlet of that river, Victoria county, a good proportion of the fish were fairly large salmon, running about 12 pounds to the fish. All of the anglers on the Tobique reported plenty of salmon and grilse in 1929, but the river was low much of the season, and the weather dry and warm; consequently, fish did not rise as they do under different conditions. More than 300 fish were taken at Hartt's island pool, York county; about 90 fish at the Hartland pool, Carleton county; and more than 500 were taken in the vicinity of the Tobique, on the St. John river, and in the outlet of the former, in Victoria county, in addition to those taken on leased or private waters of the Tobique. All but the latter water is open to the public for salmon angling.

There was a decrease of about 25 hundredweights in trout taken. In 1929 the season was very hard on brook trout. The season was so dry many of the smaller streams went practically dry and the general report was that numbers of trout were found dead, and those remaining had a hard time, being gathered in small pools and with little or no food. That condition may affect the supply of trout for a time.

PROSECUTIONS

Twenty-six prosecutions were conducted by the local officers and myself during the calendar year, for various violations, and cases against a few offenders, who could not be apprehended in time, were carried over until the beginning of the new year. One person for whom a warrant was issued left the province. The sum of \$225 was paid in fines, and another \$100 in fines is in the hands of a magistrate to be paid to the Receiver General on April 1, 1930. Fines amounting to \$150 were suspended. Six offenders paid costs amounting to \$250, including the prosecuting attorneys' fees, and the informations were withdrawn. Costs paid by the other offenders amounted to \$168. Seven of the cases were for water pollution and nineteen for illegal fishing.

CONFISCATIONS

Seventy-five confiscations were made during the year. The materials consisted of 122 nets of various types, an automobile, boats, spears and torches, and salmon. Anything that was worth taking care of was stored, for sale later, or was sold immediately. Materials, at a nominal value, worth \$150, were destroyed. Materials, some of which were seized during the 1928 season, were sold, the revenue being \$173. The fishery overseer in the Miramichi area has much trouble with poachers and would-be poachers for salmon. Of the seventy-five seizures and confiscations in District No. 3 in 1929, sixty of them were by Overseer Parks and his fishery guardians, and of the 122 nets, of types, seized eighty-one of them were in this officer's district. If the poachers had to buy new nets every time they lost one they would not be able to carry on with such persistence, but it is stated that they buy partly used nets—\$2 for a net long enough for a poacher to use—and when observed by the officer or his guardians the poacher will drop the net and get away, usually, and his loss is not great. Nothing but apprehension and a severe penalty seems to deter the poachers in that area, and the officer and his guardians, to be successful, must be constantly on watch.

FISHERY LICENCES

The following licences and permits were issued during the year:—

Kind of licence	1928	1929
Salmon gill-net or drift-net.....	122	112
Salmon net permit.....	159	160
Salmon pound-net, trap-net or weir.....	102	100
Shad gill-net or drift-net.....	270	249
Gaspereau Pound-net or trap-net.....	8	16
Bass fishery licence.....	40	36
Sturgeon fishery licence.....	10	11
Smelt gill-net licence.....	1	1
Whitefish fishery licence.....	14	15

REVENUE

Revenue from all sources during the year was as follows:—

Licences and permits.....	\$450 25
Prosecutions (fines).....	225 00
Sale of seized materials.....	173 00
Total.....	\$848 25

Credit should be given to the overseers, and a very large majority of the fishery guardians, for their active assistance during 1929.

REPORT OF SUPERVISOR S. T. GALLANT, PROVINCE OF PRINCE EDWARD ISLAND, AND THE MAGDALEN ISLANDS FOR 1929-30

The total marketed value of the fisheries of Prince Edward Island for 1929 was \$1,427,152. The following table shows the production and marketed values:—

Kinds of Fish		Quantity	Marketed Value
Cod.....	cwt.	50,160	115,852
Haddock.....	"	1,759	5,557
Hake and cusk.....	"	24,638	43,541
Herring.....	"	51,541	95,123
Mackerel.....	"	9,194	42,081
Salmon.....	"	27	595
Smelts.....	"	9,489	104,974
Cod oil.....	gal.	9,985	3,157
Caplin.....	brl.	177	547
Eels.....	cwt.	62	642
Tomcod.....	"	2,244	5,799
Clams and quahaugs.....	brl.	4,275	13,261
Lobsters and lobster products.....	cwt.	76,360	943,464
Canned.....	cases	28,399½	(686,938)
Sold in shell.....	cwt.	18,944	240,219
Tomalley.....	cases	670	8,807
Shelled meat.....	cwt.	75	7,500
Oysters.....	brl.	4,928	49,030
Scallops.....	"	120	600
Tongues and sounds.....	cwt.	84	1,735
Hair seals.....	No.	478	1,194

COD

There was an increase of 13,308 hundredweights in the cod and an increase in value. The catch by counties was as follows:—

West Prince.....	14,883 cwt.
East Prince.....	821 "
Queens.....	20,749 "
Kings.....	13,707 "

During the season Mr. George Earl, of Nova Scotia, an expert in the dressing and curing of fish, was employed by the Department to give instructions to fishermen on the proper method of dressing and curing fish. Those who followed his instructions were successful in securing better prices for their fish. Mr. Earl received large orders from the American markets for properly cured fish, but, on account of the limited quantity of this fish on hand, it was impossible to fill them. Had these orders been filled, the price for pickled fish would have been 1½ cents greater than obtained.

All of our officers have taken a course in the proper method of handling fish and are now fully competent to give instructions to the fishermen. Attention should also be given to the production of boneless cod. A large quantity of this kind of fish is imported from other provinces to supply the demand in this province; this should not be, as this is a branch of the industry that could be developed sufficiently to supply at least the demands of the province itself. Some boneless fish was put up by a number of fishermen, who received instructions from Mr. Earl, and these were equal to the best on the market. It now rests with the fishermen to do their part and the fishery officers will give them every assistance possible.

HADDOCK

There was an increase in the haddock catch of 763 hundredweights, with an increase in value. The catch by counties was as follows:—

Queens.....	159 cwt.
Kings.....	1,600 "

Haddock are practically all sold fresh and are in great demand by the consumers. They command a higher price fresh than cod.

HAKE AND CUSK

In the catch of hake and cusk there was an increase of 12,713 hundredweights and an increase in value. The catch by counties is as follows:—

West Prince.....	5,338 cwt.
Queens.....	2,846 "
Kings.....	16,454 "

This fish is consumed locally, for the most part, and a fair price is realized. In 1929, some were filleted, for the first time in this province, and it is to be hoped that this industry will be developed further this season.

HERRING

There was an increase in the 1929 herring catch of 4,090 hundredweights, and an increase in value. The catch by counties was as follows:—

West Prince.....	16,895 cwt.
East Prince.....	8,092 "
Queens.....	7,746 "
Kings.....	18,808 "

A large quantity of the herring caught in Prince Edward Island is used for fox feed. Pickled herring is consumed locally for the most part, while some sales are made in New Brunswick. It is hoped that this season all pickled herring will be inspected by the fishery officer.

MACKEREL

There was a decrease in the mackerel catch of 1,003 hundredweights with a small increase in value. The catch by counties was as follows:—

West Prince.....	2,799 cwt.
East Prince.....	354 "
Queens.....	5,119 "
Kings.....	922 "

SALMON

There was a decrease of 28 hundredweights in the salmon catch and a decrease in value.

SMELTS

The smelt catch decreased by 3,633 hundredweights, and there was a corresponding decrease in value. The catch by counties was as follows:—

West Prince.....	695 cwt.
East Prince.....	2,955 "
Queens.....	4,908 "
Kings.....	931 "

CLAMS AND QUAHAUGS

There was an increase in the clam and quahaug catch of 1,726 barrels, and an increase in value. A large quantity of the quahaugs landed in 1929 were canned by a Charlottetown firm; they were of a superior quality and in good demand.

LOBSTERS

There was an increase of 10,747 hundredweights in the lobster catch, and a corresponding increase in value. The catch by counties was as follows:—

West Prince.....	16,446 cwt.
East Prince.....	16,244 “
Queens.....	14,559 “
Kings.....	29,111 “

The increasing catch should be an incentive to the fishermen to see that every berried lobster is liberated very gently into the water, for if they are thrown in, it is not known how many eggs may be injured and to what extent the industry may suffer as a result.

There are four co-operative canneries in this province operated by fishermen; two of these packing companies have a large membership and are doing exceedingly well. In these companies each fisherman owns his own gear, such as boats, lines and traps, and it naturally follows that he is more careful in keeping his equipment in good condition; generally speaking, they land a larger catch than those engaged by other packers.

OYSTERS

In the oyster catch there was an increase of 172 barrels, with an increase in value. The catch by counties was as follows:—

West Prince.....	10 brls.
East Prince.....	110 “
Queens.....	4,771 “
Kings.....	37 “

The catch might have been much greater had not the buyers refused to accept small oysters. This action on the part of the buyers, however, resulted in the shipment of a much better quality of oysters from this province in the 1929 season and a ready market was obtained for them.

The Department during the year 1929 carried on work in oyster culture in Grand and Bideford rivers, Prince county, and in East river, Queens county. The industry will profit. Bideford river is now well stocked with oysters and should give good results in the near future. Percival river is also well stocked and a good yield within the next two years is expected.

During the season an area in East river, which was formerly a good producing area but in latter years was overrun with mussels to the extent that the fishermen gave up fishing on this bed, was cleaned. An enormous quantity of mussels was taken from this area and landed at Mount Stewart. These shells will be in perfect condition next year to prepare some new area, and in this way the oyster fishing grounds will be considerably enlarged. In the channel of the river there is an area of some two miles in length, ranging in width from 150 to 200 yards; on this area the small oysters are so numerous, apparently, that there is an insufficient supply of food for them. Were these small oysters transplanted on growing areas, no doubt in a year or two great results would follow, as has been proven by individual experiments on the part of the fishermen. This river is one of the greatest prospects for oyster culture in Canada, or, possibly North America. The same condition also applies to West river. Vernon, Seal and Orwell rivers are also well stocked with small oysters and the future of these rivers seems assured.

SCALLOPS

There was a decrease of 200 barrels in the scallop catch and a decrease in value. Alberton is the only point where this fishery is conducted on a commercial basis. The spring catch was about the same as in previous years, but the fall

catch was a complete failure, due to the fact that, during the summer, the scallops died in the bed. This applied to all the scallops areas around the province.

FISHERIES PROTECTION SERVICE

During the 1929 season there were eight patrol boats in the Protection Service, and with their assistance and that of the fisheries inspectors and guardians, attempts at illegal fishing were successfully suppressed; in fact, outside of one point, illegal fishing was practically nil.

Total number of confiscations covering violation of the Fisheries Regulations during the season of 1929, covering 100 seizures, were.....	46
Total number of prosecutions.....	12

REMARKS

On account of the very dry season and the low water supply, the mills could not allow much water to go through the fishways at Laird's, Campbell's, Dixon's and Vernon river milldams. When the water is not permitted to run through fishways they dry up, the seams open and they leak for a time.

CAPITAL AND EMPLOYMENT

The total capital invested was \$870,777, which covers lobster canneries, vessels, nets, wharves, lobster traps, ice houses, small fish houses, etc. The number of employees were:—

Number of females.....	641
Number of males.....	2,769

MAGDALEN ISLANDS

The total marketed value of the fisheries in the Magdalen Islands for 1929 was \$704,688, an increase of \$60,338, over the preceding year. The following table shows the total catch and marketed values:—

Kinds of Fish	Quantity caught	Value marketed
		\$
Cod..... cwt.	65,976	168,791
Cod oil..... gal.	10,385	5,390
Seal oil..... "	5,220	1,863
Herring..... cwt.	135,261	129,329
Mackerel..... "	21,522	72,530
Eels..... "	110	770
Smelts..... "	2,455	26,540
Clams..... brl.	2,455	14,730
Lobsters and products..... cwt.	22,564	274,160
Sold in shell..... "	2,570	{ 31,224 }
Canned..... cases	9,782½	{ 237,084 }
Tomalley..... "	494½	{ 5,852 }
Hair seals..... No.	1,440	2,564
Fish meal..... tons	77	4,750
Fish fertilizer..... "	1,000	1,000
Fish skins..... cwt.	200	561
Shelled grit..... tons	6	210
Other products..... Fish dinners..... cases	300	1,500

COD

There was a decrease in the cod catch of 24 hundredweights, with an increase in value of \$14,781.

HERRING

Herring catch increased by 25,689 hundredweights and there was an increase in value of \$30,242. The herring fishery is very valuable to the Magdalen Islands, chiefly for lobster bait purposes and for hard smoked herring. The smoked herring put up is of a first-class quality as is evidenced by the fact that there is a steady increase in the output and a good demand on the markets of the world.

MACKEREL

There was an increase in the mackerel catch of 702 hundredweights, and an increase in value of \$3,182. These fish are pickled and sold chiefly in the West Indies markets. The bulk of the fish are caught in the early spring, and only a low price is realized for them. Probably it is unlikely that there will be an increase in the summer catch, especially with handlines, until such time as there can be an international understanding arrived at whereby all fishing is suppressed until after the spawning period. Mackerel caught in the fall are fat and are among the finest fish in the sea.

SMELTS

There was an increase in the smelt catch of 2,292 hundredweights, with an increase in value of \$25,572. It is strange about smelts this season—the only place they appeared plentiful was around the Magdalen Islands, out in the middle of the gulf. It is thought that on account of not having any heavy storms during the summer to wash their food ashore, the smelts remained out in the gulf and to this fact may be attributed the small catch in the lakes and streams of the Maritime Provinces. The marketing of smelts from the Magdalen Islands is a problem that will have to be solved if these fish continue to be taken in large quantities; as they are being marketed in the fresh state, it is very necessary to forward them to market from day to day. This is impossible under the present system of transportation. Some smelts were lost last season as the time between shipments was too great. One way out of the difficulty might be the establishment of a refrigeration plant of sufficient capacity to preserve the catch until the cold weather, say, December.

CLAMS

There was a decrease in the clam catch of 320 barrels, and an increase in value of \$1,920.

LOBSTERS

There was an increase of 337 hundredweights in the lobster catch but a decrease in value of \$18,047. This decrease is due to lower prices being received for the canned product. In the 1929 season there was a much larger quantity sold in the shell, and it would not be surprising if this branch of the industry were to increase from year to year, keeping in line with the Maritime Provinces in this regard. In the Magdalen Islands we find the best equipped lobster canneries in Eastern Canada and the products of these canneries are of first-class quality. There has been a small increase in the catch from year to year, and this may be attributed to the fact that no fishing is allowed in the lagoons, which are some 28 miles in length and no doubt afford a resting place for young lobsters where they are allowed to grow unmolested. Another factor is that no illegal fishing of any kind is carried on, which speaks well for the people of the islands, who evidently understand the value of preservation of this wonderful industry.

SEALS

There was a decrease of 214 in the seal catch and a decrease in the value of \$849.

REMARKS

Navigation with the Magdalen Islands in 1929 opened about the first week in May, and, as usual, the ss. *Lovatt* with her captain and crew gave entire satisfaction in every particular.

CAPITAL INVESTED

The total capital invested in the Magdalen fishing industry in 1929, covering vessels, nets, lobster traps, wharves, ice houses, small fish and smoke houses, lobster canneries, etc., was \$714,945. The figures as to employees follow:—

Total number of females.....	309
Total number of males.....	2,666

REPORT OF SUPERVISOR J. B. SKAPTASON, PROVINCE OF MANITOBA, FOR 1929-30

The total commercial production of 1929 of all fish in Manitoba was 33,021,400 pounds, and was the highest annual production on record, exceeding that of 1928 by 2,288,800 pounds. While this is a very substantial increase, it must be admitted there was very material and important increase in production activities. The number of men employed increased from 4,172 to 4,693, fishing tugs and fish carriers from 16 to 21, sail and row boats from 938 to 1,182, gasoline craft from 118 to 152, and gill-nets increased by more than 11,000, or fully 20 per cent. The ever increasing use of gasoline boats of all sizes is perhaps the most potent agency responsible for the heavy increase in production from year to year, together, of course, with the ever increasing number of fishermen operating. The price paid to fishermen in 1929 was \$417,511 greater than in 1928 and the marketed value \$445,678 greater than 1928.

The following figures show the fluctuations in catch and value as marketed of the principal varieties of fish for the two years, 1928 and 1929:—

	1928		1929	
	Quantity	Value as marketed	Quantity	Value as marketed
	cwt.	\$	cwt.	\$
Catfish.....	1,018	10,096	116	1,205
Goldeyes.....	10,642	67,807	11,105	82,046
Mullets.....	11,657	23,797	16,767	32,755
Perch.....	1,521	17,326	932	11,799
Pickarel.....	101,870	921,010	94,055	988,563
Pike.....	36,371	154,550	54,919	225,277
Saugers.....	4,104	28,795	8,181	63,478
Trout.....	945	10,112	2,108	22,255
Tullibee.....	89,068	480,159	84,043	586,655
Whites.....	49,899	473,032	58,903	616,604

The following figures give by years for the past six years the production and number of men employed:—

Year	Quantity	Value to fishermen	Value as marketed	Number of men employed
	cwt.	\$	\$	
1924.....	177,898	886,421	1,232,563	2,828
1925.....	191,329	1,059,655	1,424,682	3,390
1926.....	304,143	1,744,234	2,296,875	3,800
1927.....	322,908	1,462,352	1,977,766	4,095
1928.....	307,326	1,620,986	2,199,027	4,172
1929.....	330,214	2,038,497	2,634,705	4,693

The following figures show the variations in market prices during the past six years:—

	1924	1925	1926	1927	1928	1929
Catfish.....	11.1	10.6	11.3	12.3	9.9	10.4
Goldeyes.....	4.4	4.2	4.0	4.7	6.4	7.8
Perch.....	10.6	11.2	13.4	10.9	12.7	12.7
Pickereel.....	8.5	11.5	10.3	8.0	9.0	10.5
Pike.....	3.5	4.0	4.0	3.7	4.0	4.1
Sturgeon.....	50.0	40.9	51.6	53.9	57.5	40.0
Trout.....	10.0	9.0	11.0	10.9	10.8	11.1
Tullibee.....	3.6	4.1	5.9	4.0	5.4	7.0
Whitefish.....	9.5	9.5	9.0	8.5	10.5	10.5
Total catch.....	6.9	7.4	7.6	6.1	7.2	7.9

It will be seen that general increases in prices are recorded all along the way, with the very important increase of a cent and a half per pound in prices of both tullibee and pickerel. The importance of this to the trade is obvious, as these two varieties of fish constitute more than half of the total production.

REVIEW OF OPERATIONS

The Sub-district of The Pas, comprising all waters in the province north of and including the Big Saskatchewan river, but no part of lake Winnipeg.

Railway extension and road making have brought a great many new waters within reasonable distance for profitable fishing operations; thus some twenty-eight lakes and rivers have been fished during the past year as against seventeen of the year before, with sixty-one more men fishing in 1929 than 1928, and resultant increase in production from 1,385,400 pounds to 1,937,500, an increase of over half a million pounds. During the current winter-fishing season some thirty-eight lakes are being fished.

In view of the fact that many of the waters in this sub-district are little known to the public, it may be of interest to give here some facts concerning them, taken from Inspector Stevenson's report:—

Sturgeon Winter Operations.—Three new waters and localities were tried out last winter for sturgeon in northern Manitoba: Fox river, a tributary of the Hayes; Angling lake, east of the Nelson in the Angling river; Red Sucker creek, emptying into God's river. The sturgeon from Fox river and its tributaries were small, dark in colour and of generally poor quality, but fairly plentiful. Sturgeon from Angling lake were of splendid quality, much larger than those from Fox river, averaging more than twenty-five pounds dressed, but they were not very plentiful. The sturgeon brought in from Red Sucker creek were also of fine quality, large and light in colour, and were fairly plentiful. Transportation from all these waters is most difficult, particularly from Red Sucker creek. Mr. Wass, who fished and handled the fish from Red Sucker creek, brought the fish by dogs to his trading post at Island lake, then by horse teams to Norway House, from there by pony and toboggans to Mile 137 Hudson Bay Railway, in all over 300 miles.

Cedar lake did fairly well: three natives with a few old nets produced over 3,000 pounds.

Only eleven licences have been issued for 1929-30 sturgeon fishing. The slump in prices, owing to considerable importation of Russian sturgeon, has brought the price offered down from 55 cents and 60 cents to 35 cents and 40 cents in three years. This has discouraged many operators where transportation difficulties were great.

Fishing for scale fish during the year was generally successful with almost one-third more men fishing. The catch per man was practically the same as 1928, and prices were materially higher throughout the season. This latter condition is, in many quarters, attributed to the existence and operation of the Fish Pool. Lake Athapapuskow, Clearwater, Cormorant, Williams, and Wedge produced their respective limits for the winter season 1928-29.

Of the new lakes operated for the 1928-29 season, Wedge lake was perhaps the best producer; the limit here was taken, mostly in fine-quality jumbo whitefish, well before the end of the season.

Wabiskok (Balsam) lake, with only three men fishing, produced nearly the limit (25 tons), mostly in large whites, with a few trout and pickerel.

Embury and Manistickwan lakes, close to the Flin Flon river, did not produce their limit. The catch consisted mostly of large whites, 10 per cent of a fine variety of trout, and some large pickerel.

Elbow lake on the Grassy river chain produced fairly well in whites, trout, and pickerel.

Kipahigan (Barrier) lake shows splendid indications. Fished only experimentally last winter, the production consisted mostly of a fine type of whitefish, not many jumbos, but an average of over three pounds; there were also a few tullibee. In the present winter season two good outfits went in there and the limit was practically taken by the end of December.

The following are a few of the new lakes fished this season, winter 1929-30, for the first time:—

Chicken lake, a small lake north of Kississing.

Kissenew, a long narrow lake running from the Saskatchewan boundary to south of Kississing; fish plentiful—trout, whites, and tullibee.

Schist lake, parallels the Flin Flon railway for fifteen miles, fish not very plentiful, but the lake will produce the limit for the 1929-30 winter season, owing to the comparatively large number of men fishing and the easy transportation facilities. Good whitefish and trout predominate here. There are also pickerel. This is one of the deepest lakes in the north, having a depth in places of about 300 feet.

Snow lake, a small lake northwest of Herb lake; good fishing, mostly whitefish.

Payak, Nistoo, and Noosap, made up of a chain of small lakes running into Athapapuskow, all producing fair quantities of large whites and pickerel.

Sissipuk lake is on the Churchill river, and the Manitoba-Saskatchewan boundary runs through it. Fair fishing is indicated. The lake has no trout, but catch mostly whites, with some tullibee and pickerel. This water, however, is not proving up to expectations. Being a good-sized lake, deep, and never having been fished before, much was expected of it, but the catch is no better than in many of our lakes that have been fished for years.

Election lake is south of Cranberry. A fair catch is being made, nearly all jumbo whites, in the 1929-30 winter season.

Hassett lake, about fifteen miles east of the Sherrit-Gordon mines, is a small lake, only about four miles long, but very deep. One man there had caught 100 boxes of trout by the middle of January, 1930, and no other kind of fish. He trapped there five years ago, and then caught for his dogs both suckers and tullibee, which now seem to have entirely disappeared or become extinct. He concludes the trout have cleaned them up. There is a larger lake

to the east with plenty of rough fish in it, but the creek normally connecting these two lakes has gone dry during a series of dry years, which may account to some extent for the shortage of rough fish in Hassett lake.

Bartlett lake, south of Kississing, consists of several narrow stretches of water, mostly deep. There is fair fishing—whitefish, pickerel, and tulibee.

Aimie lake, north of Athapapuskow, yields a fair catch of whitefish and pickerel.

Hunting lake, north of the Churchill river, is a good-sized lake about thirty miles long. Only one licence was issued there for the 1929-30 winter season, but it is reported a good whitefish lake.

Loon-head lake, north of Reed lake, is said to contain whitefish and trout.

Nokomis is a small lake southeast of Kississing lake, where there is a fair catch of whitefish, pickerel and pike.

Russic Lake, north of Kississing, is a small deep lake, with fair fishing for whitefish, pike and pickerel. This lake is noted for its large pike, and jumbo whites.

Pakwa Lake is on the Grassy river, and reputed as a good whitefish lake.

Many of these small lakes that have no dependable feeders will hardly support extensive continuous fishing. A peculiar feature of some of them is the large size of the fish found. In one small lake, just over the Saskatchewan boundary, the smallest whites were between six and seven pounds. Many of these lakes are in what is called the "Mineral Belt," and the bottom is all rock. The inspector is of the opinion that the food supply in them is poor for bottom feeders like whitefish, and cites in support of that view his own experience of last winter, when he opened up large numbers of whitefish and found nothing in their stomachs excepting minnows, unnatural in the case of whitefish. Most of these lakes are deep but fish are seldom caught in deeper water than forty feet.

Summer operations were carried out on Moose lake during the 1929 summer, but, owing to low water, a great deal of difficulty was experienced in getting the catch out. However, the limit was taken and marketed in good condition. There was also a small amount of summer fishing permitted and carried on in lakes adjacent to the Flin Flon and Sheritt-Gordon mining properties. The catches were all for local consumption.

Lake Winnipegosis

The summer operation on lake Winnipegosis resulted in the limit of whitefish and pickerel being taken in four weeks, instead of the seven weeks fishing season. The catch actually over-ran the limit about 80,000 pounds. There were twenty-six more men fishing than the previous year. So it may be said that the catch per man did not materially differ from that of 1928. The winter catch shows a very material increase all along the line, with thirty-five more men fishing. There was an increase of 1,357,600 pounds, which works out a fully 3,000 pounds for each man fishing, more than the individual catch of 1928. This, however, is hardly a fair conclusion, and is accounted for, at least in part, by seasonal and weather conditions. In the early winter of 1928-29, there was very little snow, so that little fish was hauled in off the north end of the lake to Mafeking, leaving much of the early catch on the lake until after January 1, 1929, and this quantity was therefore credited to 1929. Last fall conditions were fairly normal so that fish could be brought in as soon as caught. It may, therefore, be said the actual winter seasons catch will be pretty well on a par with 1928.

Lake Winnipegosis comparative figures:—

—	1928				1929			
	Whites	Pick- erel	Mixed fish	Num- ber men	Whites	Pick- erel	Mixed fish	Num- ber men
	cwt.	cwt.	cwt.		cwt.	cwt.	cwt.	
Summer.....	1,323	8,668	1,561	183	2,215	6,348	1,727	207
Winter.....	5,422	16,204	23,140	407	7,831	17,86	3,735	442

Waterhen and Dauphin

Lake Waterhen shows no appreciable difference in the two years, 1928 and 1929.

Lake Dauphin had an exceptional year in 1929, producing 1,460,000 pounds of fish, of which 846,300 pounds were pickerel. In 1928 the catch was 384,400 pounds when the pickerel landings were 204,400 pounds. The number of operators on this lake increased in 1929 from 47 to 168; and for the current winter season this is increased to 260. It will be noticed that the increased production is slightly greater proportionally than the increase in men fishing. In 1925 the production was only slightly in excess of 100,000 pounds for 24 men. This was reduced in 1926 when 25 fishermen produced only 87,600 pounds. It was then thought the lake was practically depleted, but 1927-28-29 have witnessed a marvelous revival, culminating in the high mark reached in 1929. The theory is generally accepted that the gains are due to migrations from lake Winnipegosis in the high water years of 1927-28. Following are comparative figures for Lake Dauphin:—

—	1926	1927	1928	1929
Number of fishermen.....	25	21	47	163
Total production.....	cwt. 876	cwt. 2,313	cwt. 3,844	cwt. 14,600
Catch per man.....	35	110	82	87

Manitoba and St. Martin

Lake Manitoba records a slight decrease in production in 1929 but with 34 fewer men fishing than in 1928, the average per man was higher for 1929 by 100 pounds. The following are five years' figures for Lake Manitoba:—

—	1925	1926	1927	1928	1929
Number of fishermen.....	905	1,128	1,126	1,082	1,043
Total production.....	cwt. 51,587	cwt. 85,256	cwt. 77,856	cwt. 57,463	cwt. 56,625
Catch per man.....	57	76	69	53	54

From outward appearance the 1929 figures would appear fairly satisfactory, but the facts revealed on review are that the totals were bolstered by substantial gains in all the lower grade varieties, such as suckers, pike, saugers and tullibee, while the catch of the more valuable pickerel and perch in 1929 were

barely half of the total for the previous year. The pickerel catch dropped from 2,248,800 to 1,133,000 pounds. There can be little question the general concern felt for the future of this valuable lake is fully justified.

Lake St. Martin, with nine more men fishing, had a slightly increased production in 1929 but fully in proportion to the added number of operators. Pickerel, however, showed a sharp decline in catch.

Lake Winnipeg

A decrease in production of 611,400 pounds, with 282 more men engaged than in 1928, was shown on Lake Winnipeg. The following are the comparative figures for 1928 and 1929:—

	1928					1929				
	Whites	Pickerel	Tullibee	Other fish	Men	Whites	Pickerel	Tullibee	Other fish	Men
Summer.....	26,538	32,407	30,739	8,251	1,483	25,116	34,774	25,666	15,096	1,564
Winter.....	4,355	16,772	41,568	8,269	691	7,762	9,756	32,729	11,886	892
Total.....	30,893	49,179	72,307	16,520	2,174	32,878	44,530	58,395	26,982	2,456

There is no outstanding difference between the two years. It will be seen there was a falling off in both tullibee and pickerel in 1929 in spite of the increased number of men fishing, and the increased number was almost entirely in men in these two fisheries. The most serious showing is in that of winter tullibee, with a drop of nearly 900,000 pounds, although there was an added number of fishermen, 201, all of whom were tullibee men.

There was considerable increase in winter production of whitefish. This was due entirely to some large outfits operating in northern areas of the lake, Eagle and Horse islands.

Pike showed a very important increase in summer from 342,300 pounds to 1,070,500, or a gain of 728,200 pounds. Saugers more than doubled. The principal decreases were in catfish, goldeyes and tullibee.

In spite of the per-man drop in production, fishermen had a fair year, owing to the higher prices that generally prevailed. It may be noted that the companies operating for summer whitefish raised the price, which had been set for more than ten years, from 5 cents to 5½ cents to fishermen. Other prices were also slightly higher in open water fishing. This was particularly marked in tullibee fishing which resulted in practically the same total paid to fishermen in 1929 for 500,000 pounds less fish than in 1928. The big spread in prices as between 1928 and 1929, however, come in lake Winnipeg's winter tullibee from 4¼ cents to 8¾ cents. Such fancy prices as 11 cents to 12 cents were quoted for the early fish on the market. This dropped, however, as the season advanced, resulting in the above average. No doubt supply and demand and shortage of ciscoes were the chief causes for the high prices paid, but there was another element which, no doubt, was an important factor in the early high prices paid—the Fish Pool. The Pool's aim was to hold up prices on as high a level as possible. While before the end of the season they suffered perhaps more than any of the other selling agencies, and had to carry over a bigger load than any of the others, that condition may be attributed to several causes.

DEVELOPMENTS IN 1929

It was mentioned in my last report that a new concern was preparing for operation on lake Winnipeg—the Lake Manitoba Fisheries. This company had

been established on lake Manitoba for some years but, with its resources augmented by New York capital, it established itself in Selkirk during the year. A very fine plant was built and a steel hull oil burning tug as a fish carrier. The company operated quite extensively during the late summer and in the fall pickerel and tullibee fishing.

As indicated by the increased number of tugs and gasoline boats, there has been considerable expansion on lake Winnipeg amongst independent operators, who have acquired fish carrying boats capable of handling from 100 to 300 boxes of fish. These boats are variously equipped with gas, oil or steam engines.

The Fish Pool, or Manitoba Co-operative Fisheries, completed its first year of operation at the end of August, 1929, and during that initial year handled 2,987,632 pounds fresh; 7,008,499 pounds frozen; total, 9,996,131. This quantity was from 477 pool members and 200 non-members. Of the upwards of ten million pounds of fish handled, 9,400,000 pounds were of winter production. The total winter production for the province for the same period was 21,300,000, so it will be seen the pool operations came within 10 per cent of being half of the total production.

The feeling seems fairly general that experience gained by the pool during its first year has fully justified the movement for co-operation; only inexperience in management of such large affairs have caused the pool to fall short of fullest expectations in results.

HUDSON BAY RESOURCES

A quick trip visit was made to the Churchill at Hudson Bay during the late summer, the object being to ascertain what available information there was relative to the fisheries of the bay and the estuaries of the big rivers. A special report was made to the department, in which a recommendation was made to send a properly equipped trawler from the outside to investigate conditions in the deeper areas of the bay.

Along the Manitoba coast line and entering the rivers, there appear to be two important varieties of fish, the Arctic trout and herring or ciscoes. The former centre on the Churchill, while the latter seem more plentiful towards the Nelson, also whitefish although these fish are apparently not very plentiful. There are also to be found indefinite indications of both cod and halibut, but nothing to base a conclusion on whether or not these are indigenous to the waters of the bay.

Speckled trout run up the Nelson as far as Kettle rapids during August and September, and are to be found during these months in the streams between these rapids and tide water. They seem to disappear sometime before freeze-up, and it is thought they go out to sea.

ANGLING LICENCES

Non-resident angling licences almost doubled during the year, rising from 1,113 to 2,039. The particulars follow:—

1,689 one day licences.....	\$	1,689
201 two day licences.....		402
24 three day licences.....		72
125 season licences.....		625
	\$	2,788

These licences were sold almost entirely to North Dakota Americans, and were used mostly on Oak lake, lake Killarney and Rock lake, and some small lakes in the Turtle mountains. Pickerel and pike are the principal attraction. The first named has become fairly plentiful in some of these waters as a result of transfers of fry from Gull Harbour hatchery.

PROSECUTIONS

There were forty-seven prosecutions in the province during the year for infractions of the regulations as follows:—

For using illegal contrivance.....	10
For using illegal mesh.....	13
Fishing without licence.....	9
Non-resident angling without licence.....	6
Possession in close season.....	4
Fishing in fishway.....	2
Fishing in closed season.....	3
	<hr/> 47

There were 131 confiscations in the province for the year.

The amount received in fines was \$589, and from the sale of confiscated articles, \$1,335,26; or a total of \$1,924,26.

REPORT OF SUPERVISOR G. C. MACDONALD, PROVINCE OF SASKATCHEWAN, FOR 1929-30

During the calendar year 1929 the commercial fisheries production for the province of Saskatchewan was 61,260 hundredweights. This was a decrease of 671 hundredweights from the previous year. The increase or decrease by species in 1929 was as follows:—

	Increase	Decrease
	cwt.	cwt.
Whitefish.....	2,367	
Trout.....	70	
Tullibee.....	435	
Sturgeon.....	11	
Cisco.....	22	
Pike.....		1,239
Pickarel.....		219
Mullets.....		1,085
Goideyes.....		26
Mixed.....		1,007
	<hr/> 2,905	<hr/> 3,576

The total marketed value of the commercial production during the year was \$572,830, an increase over the previous year of \$10,027. This increase in value is attributed to the increase in production of whitefish shipped in a green condition and bringing a more profitable return to the producer.

There was a small increase in production of whitefish on Jackfish, Turtle, Brightsand, Makwa, Ministikwan, des Isles, Flotten, Keeley, Peter Pond, Fox, Knee, Dore and Big Bear lakes, and in lakes in the northeastern portion of the province under the supervision of Manitoba. Small decreases took place at Murray, Pierce, Toy, Churchill, Deep River, Isle a la Crosse, Wolf, Green and La Ronge lakes.

The bulk of the net decrease shown for pike was on Isle a la Crosse lake and waters located in the northeastern portion of the province. On other waters there were minor decreases or increases, due to some extent to the nature of operations. On some lakes fishing opened about the first of the winter season, when fishermen used shallow nets and operated in shallower waters pending the freezing of the deeper portions of the lake, with a larger production of coarse fish as a result. On other lakes operations were late in opening up owing to

fishermen being unable to reach the lakes because of poor ice conditions, and this allowed nets to be set in the deeper waters where the proportion of the coarser species was considerably less.

UNSPAWNED WHITEFISH

On a number of waters the fall operations did not open up until well on in December, and even on lakes where the season opened on December 16 a considerable quantity of unspawned whitefish were taken. This condition was more noticeable than in any previous year and was attributed to the unusually mild weather prevailing up to about December 1, when a sudden lowering in temperature formed a thin covering of ice, and was followed by a heavy fall of snow. This blanket prevented the lowering of the temperature in the water, with the result that the whitefish were late in spawning. This unusual condition may affect the production in a future season.

SUMMER PRODUCTION

The summer production was 1,731 hundredweights with a market value of \$16,253, being a decrease of 726 hundredweights of fish and \$10,751 in value from the previous year. Turtle lake showed an increase of 269 hundredweights, Okemasis lake 150 hundredweights, Des Isles lake 13 hundredweights, and Churchill river 180 hundredweights. (This latter district was previously credited to Manitoba.) There was a decrease of 207 hundredweights in Makwa lake catch and 984 hundredweights in the case of Long lake owing to there being no summer fishing allowed; and 106 hundredweights of coarse fish on the Saskatchewan river, owing largely to low waters. The summer production has been gradually decreasing owing to the closing of operations during the summer on lakes situated within reasonable distance of the railroad, and when the production is being marketed green during the winter season and bringing a more profitable return to the producer.

GREEN FISH

The total shipments of unfrozen fish during the winter season was 3,874 hundredweights. Of this amount 3,826 hundredweights were whitefish, 44 hundredweights pickerel and 4 hundredweights trout. This was an increase over the previous year's figures of 950 hundredweights—an increase of 954 hundredweights of whitefish, 18 hundredweights of pickerel and a decrease of 16 hundredweights of trout and 6 hundredweights of tullibee. On Jackfish and Murray lakes, where the limits are 150,000 pounds and 35,000 pounds, respectively, the entire production of whitefish was marketed in a green condition, except 1,000 pounds frozen. This was largely due to these lakes being situated on the rail. Other lakes from which green fish was shipped were Turtle, Waterhen, Makwa, Brightsand, Ministikwan and Des Isles. A horse haul of up to 75 miles to the rail head was entailed in this instance.

EQUIPMENT

The value of equipment used during the year was \$121,910, an increase in value over 1928 of \$3,348. An increase of 1,384 gill nets valued at \$2,689 was shown. There was an increase of one gasoline boat, valued at \$290, and an increase of \$295 in the value of row boats. There was a decrease of 81 lines, a condition due to the fact that no hook fishing was allowed in the lakes in the Qu'Appelle valley, where it was found too many of the angling species had been taken.

CONDITION OF FISHERIES

The general condition of the fisheries throughout the province could be considered as favourable. No new lakes were opened up during the year; it was arranged to cut trails to waters north of Isle a la Crosse, but the unusual weather conditions were unfavourable. A start was made on the opening of a winter trail from Nipawin to Dechambault and Ballantine lakes, and the projection of railways in that area will bring a number of valuable fishing lakes within reasonable reach of the rail head.

Favourable results from the planting of whitefish in Jackfish and Okemasis lakes were plainly noticeable, and considerable quantities of these fish are now taken from both these waters. The catch of cisco from Quill lakes is increasing.

The only waters south of the North Saskatchewan river where commercial production is carried on are the chain of lakes in the Qu'Appelle valley, where the total production in 1929 was 34,000 pounds.

While the fall operations were late in opening up, owing to poor ice, the general climatic conditions were favourable, and a surplus of freight teams were available. Fish were removed from the ice rapidly and hauled to the rail head.

OBSERVANCE OF REGULATIONS

During the year there were 98 prosecutions and a conviction was obtained in all cases except four. Penalties amounting to \$693 were imposed with additional court costs against defendants of \$256.20. The summary of cases follows:—

Fishing during closed season.....	17
Fishing with illegal apparatus.....	41
Fishing without a licence.....	22
Illegal possession of fish.....	9
Fishing in prohibited area.....	5
	<hr/>
	94

There were also 122 confiscations made during the year, as follows:—

Legal apparatus.....	46
Illegal apparatus.....	48
Illegally caught fish.....	28
	<hr/>
	122

There were 56 sales of confiscated articles during the year, realizing \$563.97.

FISHWAYS AND DAMS

Practically no changes can be reported as to fishways and dams. The dam of the Canadian National Railways on the Carrot river near Melfort has been abandoned as the town of Melfort constructed an elaborate dam about one-half mile down stream to provide a water supply for the town. This dam created a pool of water which is backed up to the Canadian National dam. This pool would appear likely to become an ideal water for fish when other conditions improve.

DOMESTIC NET FISHING

There was a total production of 29,493 hundredweights fish taken under domestic net licence, an increase over the previous year of 14,044 hundredweights. The increase was largely due to the inclusion of fish taken from waters in the extreme northeastern portion of the province, which was credited to Manitoba in previous years. There was an increase of 83 in the number of domestic licences issued.

ANGLING

The estimated catch taken by anglers as reported by the various Fishery Inspectors during the year was 22,114 hundredweights of all species of fish. This was a decrease from the previous year of 178 hundredweights. The estimated number of anglers reported was 47,663, an increase over 1928 figures of 4,323. The average catch per angler was 46 pounds of fish, a decrease of 6 pounds per angler from the previous year. Angling for trout recently planted in the Cypress Hills area opened up for the first time during the season, and, while the catch was small, considerable local interest was taken by the anglers, and some 139 angling permits were issued for trout fishing, in addition to 316 at other points in the province, largely to non-residents. The total catches of different species of fish taken by anglers from provincial waters during the year were as follows: pickerel, 5,255 hundredweights; pike, 15,496 hundredweights; perch, 710 hundredweights; goldeye, 370 hundredweights; trout, 3 hundredweights; mixed, 280 hundredweights.

EXAMINATION OF WATERS

Twenty waters were examined in the district during the year by the various fishery officers to determine their suitability for fish. Of this number eight were reported as suitable; seven lakes were stocked by the fishery officers by transfer from other waters in the district, and considerable assistance was given to the hatchery staff in the moving of fry from the hatchery to the various lakes. A number of waters previously stocked are now showing results. Close co-operation between the various fishery officers and the hatchery staff is being maintained.

REPORT OF SUPERVISOR R. T. RODD, PROVINCE OF ALBERTA,
FOR 1929-30

During the calendar year 1929 the total production from commercial fishing in Alberta amounted to 79,388 hundredweights of all kinds of fish, an increase of 7,613 hundredweights over the production in 1928. The landed value of the catch was \$400,022 and the marketed value \$732,197. There were increased catches in both the summer and winter seasons, the increase for summer being 4,695 hundredweights and for winter 2,918 hundredweights over the production for the same periods of 1928. The following table shows how the production for 1929 was made up, and also shows where increases or decreases occurred in the different kinds of fish:—

SUMMER SEASON

Kind	Cwt.	Increase	Decrease
Trout.....	22,273	4,260	
Whitefish.....	14,590		301
Perch.....	408		152
Pickerel.....	5,025		160
Pike.....	2,128		82
Tullibee.....	1,065	47	
Goldeyes.....	10		
Mullets.....	365	95	
Mixed fish.....	2,886	988	
Total.....	48,750	5,390	695

MARINE AND FISHERIES

WINTER SEASONS

Kind	Cwt.	Increase	Decrease
Trout.....	1,218		140
Whitefish.....	13,501	1,332	
Perch.....	290	33	
Pickerele.....	2,393		901
Pike.....	5,987	1,555	
Tullibee.....	4,562	1,411	
Goldeyes.....	1	1	
Mullets.....	66		178
Mixed fish.....	2,620		195
Total.....	30,638	4,332	1,414

The increase in summer fishing was due chiefly to the limit being taken on lake Athabasca for the first time, and in winter chiefly to a large part of the limitations for Cold and Primrose lakes for 1928-29 being taken in January, 1929, and practically all the limit for 1929-30 being taken in Primrose lake in December, 1929. There was also a large increase in the production of tullibee at lac la Biche.

There were small increases in production on some other lakes, but owing to the annual limitations for most of the lakes these increases were necessarily small. On one or two lakes the production was not up to the usual amount and in other lakes, where limitations include two or three different species, there were increases in the amount of one species taken and decreases in the case of some of the other species.

Lake Athabasca showed an increase of 4,260 hundredweights of trout and 236 hundredweights of whitefish, but there was a decrease in the pike and pickerel landings. The large companies carried on their fishing in the areas well to the east end of the lake not frequented by pike and pickerel, and did not attempt any fishing in the western end of the lake, where these species are found in large quantities. The local residents who, in the previous season, fished on commercial licences for local sale and produced quantities of pike and pickerel, confined their 1929 fishing to Domestic licences.

Lesser Slave lake showed an increase in the production of pickerel in summer fishing, a slight increase in the whitefish, but a decrease in pike, perch, mixed fish and mullets.

Lac Ste. Anne showed an increase in pickerel, pike and mixed fish, but a decrease in whitefish, although the limitation was taken.

Lac la Biche showed an increase in the summer fishing in pike, pickerel and whitefish and mullets, but a decrease in tullibee and mixed fish. There was a large increase in the winter production of tullibee, pike and mixed fish and a decrease in pickerel and whitefish.

Lesser Slave Lake District operations resulted in a decrease in winter production, owing to a later freeze-up than usual, which prevented the fishermen from reaching some of the small outlying lakes when the season opened and when fishing in these lakes is at its best. Three of these small lakes were scarcely fished at all as fishing was considered unprofitable after a certain period.

Moose Lake produced very little fish and showed a decrease of 750 hundredweights in all kinds of fish. The fishermen and the local inspector attribute this to excessive growth of vegetation in the lake, and to continued high winds throughout the better part of the fishing, which caused the vegetation to break

up and drift into the nets. It was stated that it was almost impossible to keep nets clean and for a great while the fishermen ceased operations altogether. This occurred at a time which was conceded to be the best fishing period in that lake.

MARKETS

Marketing conditions were not up to the average during the year, so far as prices were concerned. At some points good prices were obtained during the summer owing to the exceptionally fine quality of fish, such as at lac la Biche, but prices at other points were lower. For winter fishing prices were much lower, especially for the frozen fish. The price for fresh fish was also lower than it had been in past seasons. The amount of fresh fish shipped was approximately 350,000 pounds for the entire province. The higher price received for this small amount did not materially increase the average for the entire winter production.

Greater effort is being made by local producers to find markets directly south of the international boundary.

CONDITION OF THE FISHERIES

Except in the few cases cited above where conditions were below normal, the conditions attending fishing throughout the province were very favourable. Weather conditions during the summer months were perhaps more favourable than they have been for several seasons. Fishing was carried on without much delay caused by storms and there was no equipment reported lost. This is most unusual, especially on Lesser Slave lake where there are generally bad storms during September and, usually, a loss of nets.

At the beginning of the winter season the ice was not safe on some of the lakes and the fishermen were delayed in getting their nets set. There was very mild weather in the early part of December, 1928; consequently the ice did not make on the lakes early, and in unsettled districts, where there are no roads and where the fishermen have to cross muskeg country to reach the lakes, they were delayed until the muskegs froze and they could move their equipment.

Considerable improvement was noticed in the fishing at Lesser Slave lake during the summer season. The whitefish averaged much larger than they did during several years previously. The fishing was also much better during August and September. The limitation was taken some time before the end of the season. Lake Wabamun also produced the limit in whitefish during the summer and exceeded the winter limitation in two weeks' fishing. There was also a slight increase in the average weight of the whitefish. There was also a great improvement in the class of fish taken from Pigeon lake. The catch in the 1929 season was over ninety per cent whitefish, while in the preceding season about a third of the catch was pickerel. There were seventy-three less fishermen on the lake, but the limit was taken in about the same time as in 1928.

Conditions at lac Ste. Anne were unusual. It was found that the whitefish were dropping off, while, due to the fact that only five and one-half inch mesh nets were allowed, the pickerel and suckers were increasing. In order to improve conditions, areas were defined in which four and one-half inch mesh nets might be used. The result was that the limitation of whitefish and pickerel was taken, the greater proportion being pickerel.

Fishing conditions in lac la Biche are abnormal. This lake has wonderful jumbo whitefish and developed into one of the greatest lakes in the province. During the summer fishing the catch is largely whitefish, with some pickerel, pike, and tulibee, while during the winter fishing very few whitefish are caught. During the summer season of 1929 ninety-five per cent of the whitefish produced were what are known among the fishermen and dealers as "jumbos," fish of over four pounds weight dressed. All fishermen who could do so purchased

nets of six and six and one-half inch mesh, but those who used the five and one-half inch mesh stated that their catch contained just as many jumbos as were taken by those who used the larger mesh. During the winter fishing scarcely any whitefish could be found, while the production of tulibee was exceptional. This lake appears to be in excellent condition.

Lake Athabasca fishing was at least up to normal but, due to improved facilities and equipment, the limitation was reached for the first time, though fishing was carried on for a slightly shorter period. The companies operating erected more fishing stations or moved those already in existence closer to the fishing grounds. One extra barge was put into commission on the Athabasca river, one of the freight boats or tugs was enlarged sufficiently to handle double the amount of fish, and a large river tug was built and put in operation on the river to handle some of the barges. Better and deeper nets were used than formerly, to enable the fishermen to operate in deeper waters, and new and larger fish boats put in operation. Facilities were also improved at Waterways for handling the fish. The two freezing and cold storage plants were operated to capacity and nearly a million pounds of trout were frozen. Most of this was shipped after fishing operations ceased. This prevented the market from being flooded with fresh fish from lake Athabasca during the summer. The two freezing cold storage and packing plants gave employment to approximately forty-five men during the season.

EQUIPMENT

Besides the increase and improvement in equipment on lake Athabasca there was a general tendency towards improvement throughout the province. This was especially so in regard to the nets. A better quality of nets were used on nearly all the lakes, many being of greater depth, which required more leads and floats, and were thus more costly. On lake Athabasca the operators explain that at least fifty per cent of the nets had to be replaced during the season, due to heavy storms and to the fact that the trout are destructive of nets.

LICENCES AND PERMITS

There was a large and gratifying increase in the number of angling permits sold during the season, as compared with the 1928 season, as well as an increase in all other licences issued. From the beginning of the fiscal year April 1, 1929, to January 31, 1930, the number issued was as follows:—

Angling permits.....	8,270
Commercial and fishermen's licences.....	1,244
Domestic licences.....	410
Indian and half-breed permits.....	1,080
Total.....	11,004

The increase over the 1928 total was 2,766.

TRANSPORTATION

With the improvement in the boats and barges of the fish companies and the prompt attention given by the river navigation companies and the railways and express companies, all fish were handled in excellent condition. No complaints were received regarding shortage of cars or avoidable delays in shipments.

OBSERVATION OF THE REGULATIONS

While the number of prosecutions and confiscations in 1929 were nearly as many as in 1928, it is generally conceded that there was better observance of the regulations, as witness the increase in the sale of licences and permits,

etc. The very large increase in the sale of angling permits, as well as other licences, indicates that a greater number of persons fished. The fact that it was generally known that the various police bodies were giving assistance in the protection of the fisheries, and that the permanent staff of the hatcheries were authorized to act as guardians, doubtless tended to lessen offending. The efficient work and close attention to their work of the fishery officers had the desired effect; the Calgary and Edmonton newspapers gave great assistance by giving nearly a full page to the publication of the regulations. Publicity and co-operation was also forthcoming from the thirty-nine fish and game associations throughout the province. The following is a list of these organizations functioning:—

- Red Deer Fish and Game Association.
- Medicine Hat Fish and Game Association.
- Craigmyle Fish and Game Association.
- Olds Fish and Game Association.
- Didsbury Fish and Game Association.
- Calgary Fish and Game Association.
- Edmonton Fish and Game Association.
- Nanton Fish and Game Association.
- Sheep Creek Fish and Game Association.
- Midnapore Fish and Game Association.
- Claresholm Fish and Game Association.
- Delia Fish and Game Association.
- Drumheller Fish and Game Association.
- Hanna Fish and Game Association.
- Banff Fish and Game Association.
- Carstairs Fish and Game Association.
- MacLeod Fish and Game Association.
- Carbon Fish and Game Association.
- Hillcrest Fish and Game Association.
- Pincher Creek Fish and Game Association.
- Strathmore Fish and Game Association.
- High River Fish and Game Association.
- Camrose Fish and Game Association.
- Cadogan Fish and Game Association.
- Jasper Fish and Game Association.
- Vulcan Fish and Game Association.
- Staveley Fish and Game Association.
- Bassano Fish and Game Association.
- Brooks Fish and Game Association.
- Coleman Fish and Game Association.
- Carseland Fish and Game Association.
- Nordegg Fish and Game Association.
- Bentley Fish and Game Association.
- Lacombe Fish and Game Association.
- Castor Fish and Game Association.
- Saunders Fish and Game Association.
- Lethbridge Rod and Gun Club.
- Cardston Rod and Gun Club.
- Killam Rod and Gun Club.

There is also a provincial fish and game association.

There were sixty-four prosecutions and forty-four confiscations during the ten months from April 1, 1929, to January 31, 1930. Details of prosecutions are as follows:—

15	— Fishing without an angling permit.
12	— Possession of fish and fishing in closed season.
11	— Angling in closed waters.
9	— Fishing with snares, spears, etc.
3	— Angling in closed season.
2	— Fishing without a licence.
2	— Setting nets before the season started.
2	— Having undersized trout.
2	— Fishing with illegal gill-nets.
1	— Exceeding per diem catch.
1	— Fishing without a disgorgers.
1	— Obstructing creek with traps.
1	— Pollution of stream.
1	— Selling and trading whitefish in closed season.
1	— Fishing without half-breed permit.
—	—
Total	64
—	—

IRRIGATION SYSTEMS

During the early part of the 1929 season there was sufficient moisture, and in some areas heavy floods, which made it unnecessary to irrigate until after July, but later in the season there was a long period of dry weather, which made heavy irrigation necessary until almost freeze-up. Some of the rivers became very low and the irrigation systems were for some time taking all the water they were permitted to take. A close check was kept on these systems to prevent loss of fish, and it was found that, with the exception of the case of one small system, very little, if any, loss of fish occurred. Measures will be taken to prevent this system from doing any damage in the future.

DAMS AND FISHWAYS

The new dam constructed by the town of Claresholm last season in Willow creek was again destroyed during the spring floods and has not been replaced. It has not yet been decided whether or not it will be rebuilt. A fishway was constructed in the dam in Beaver creek, owned by Jackson Brothers, of Claresholm and McLeod. During the heavy floods in July, part of the large dam in the Bow river at Carseland, owned by the Canada Land and Irrigation Company, was washed out. This has been replaced by a concrete dam, and a large concrete fishway was constructed at the same time, which should prove beneficial. It is not yet known what will be required in the Calgary Power Company's large dam in the Bow river, west of Calgary. This cannot be determined until the reservoir is filled, and there is an overflow through the spillway. The company, however, has agreed to construct anything necessary and co-operate in every way possible to prevent obstruction or loss of fish. The dam in Pipestone creek at Gwynne, owned by the Canadian Pacific Railway, has been removed and the fishway in the dam at Bigstone creek, near Wetaskiwin, was repaired by the same company. All other dams and fishways throughout the province were inspected regularly and found satisfactory.

ANGLING

While the sale of angling permits reached a new high level in 1929, showing an increase of 2,440 over the number sold in 1928, there was a slight decrease in the amount of trout taken. On the other hand, there were increases in the

catches of Arctic grayling and Rocky Mountain whitefish, pike, pickerel and perch. The estimated catch for the season was as follows: —

Trout (all species).....	1,779 cwt.
Arctic Grayling and Rocky Mountain Whitefish.....	1,640 "
Pike.....	10,059 "
Pickerel.....	2,820 "
Goldeyes.....	70 "
Perch.....	1,190 "
Total.....	17,558 "

At Cold lake there was very little increase in the total amount of trout taken by anglers, and a decrease in the amount per angler. In 1928, 630 anglers took 32,025 pounds while in the 1929 season 894 took 32,410 pounds. The local inspector states that the fish taken averaged larger than they have for several years and that when the weather was suitable there was no trouble for the anglers to get their limit, but owing to much windy weather a lot of time was lost. Two exceptionally large trout were taken by anglers during the summer, one weighing 52 pounds and the other 47½ pounds.

Angling in the streams in the southern part of the province was very good at the beginning of the season but, owing to there being, first, heavy floods and afterwards dry hot weather, later conditions changed materially. The streams in the Crow's Nest area fished well until the end of July, but the water got very low and warm in August and the reports were that many streams got so low and warm that the fish went down to the larger rivers or ascended to the colder waters at the head of the streams in the forest reserves where no fishing was allowed. This also applied to the Calgary district and, owing to the extreme dry weather and the danger of fires, the forestry officials were compelled to prohibit anyone from going into the reserves. No fishing was allowed in the Crow's Nest or Bow river reserves from August 3 to the end of the season.

When the weather became cooler towards the end of the season the trout again appeared in the streams and good angling for trout was obtained for the last month. Rocky Mountain whitefish also appeared in greater numbers in September and October and exceptionally good fishing was obtained during the last three weeks of the season. Good fishing was obtained in the Red Deer river and tributaries at the beginning of the season for Dolly Varden trout, with a good percentage of Loch Leven trout. Rocky Mountain whitefish also appeared in great numbers in the later season to spawn. This was towards the end of September, which is after the season closed for fishing in these waters.

Rainbow trout fishing in the streams west of Edmonton was not very good. There was not much high water in the spring and, the streams being small, they became very low and warm during July and August, although some good catches of rainbow were obtained in some places. The Arctic grayling appeared in these streams in great numbers in September and October and exceptionally good catches were obtained. Specimens brought to the supervisor's office by anglers averaged from one to one and three-quarter pounds, the largest yet seen by the Supervisor.

LOSS OF FISH (RESCUING STRANDED FISH)

During the winter of 1928-29, some of the trout streams being low they froze to the bottom on some of the shallows. This caused the water in the pools to become stagnant and in other places the water seeped away, leaving the fish stranded. At one time it was thought that the loss would be great but investigation by the inspectors and guardians proved that the situation was no as bad as expected. However, the final report from the officers and guardians showed that one and a half miles of Pekisko creek, and a half mile of Sullivan creek, were frozen solid, and all fish in these areas were killed. Springs lower down in these streams were all that saved the fish below these frozen areas. These

springs kept the water from becoming stagnant. Reports from the Red Deer river and Crow's Nest district showed no loss. Part of the north fork of Sheep creek froze to the bottom, but this was not known until too late to be investigated; nothing definite is known as to the loss of fish there. To prevent such loss from occurring in the subsequent season all officers were instructed to examine streams and where it was found that the water was spread over wide creek beds, and where there was a possibility of these places freezing to the bottom, to make narrow channels through these shallows to confine the water into smaller areas and create greater depths and current. This will generally prevent the creek from freezing to the bottom at such points. At the same time these officers were instructed to examine closely for stranded fish in pools and backwaters, where fish were likely to be cut off from the main stream, and remove these fish to larger streams. Several heavy storms made it unnecessary to do any work in some areas, but one guardian during the fall season rescued 44,000 Rocky Mountain whitefish and 100 Dolly Varden trout, and at the same time destroyed 4,000 suckers. Another guardian made over ninety yards of channel at various points on Pekisko creek, where it froze to the bottom in the previous season, and at the same time rescued a number of trout and destroyed 153 suckers and ling.

About July 1 there was a cloud-burst on the headquarters of the Bow, Elbow and Highwood rivers and Sheep creek, which caused considerable damage, especially in the city of Calgary and the town of High River. It also took out part of the large dam in the Bow river at Carseland, owned by the Canada Land and Irrigation Company. In Calgary considerable damage was done to residential property and when the water receded fish were found in many of the basements. Great trout fishing was obtained in the Bow river below the Carseland dam and in the lower reaches of the Highwood river where trout were scarcely ever found before. Rainbow and Cutthroat trout up to four and one-half pounds were taken in these places. It is evident that these fish were carried down by the floods and while no evidence was obtained it is generally considered that a considerable amount of spawn and young fish were destroyed by being buried in silt or washed on to flooded lands and left stranded. The effects of this flood will be noticed in the next few years.

EXAMINATION OF LAKES AND STREAMS—RESTOCKING

Eighteen lakes were examined during the 1929 season to determine their suitability for fish. Only five were found suitable for the coarser varieties of fish and will be stocked as soon as possible.

Nine lakes were stocked during the season by transfer from other lakes. Eight were stocked with perch, and one with both perch and pickerel. This work was in addition to the stocking done by the staff of the various hatcheries.

Reports have been received of excellent results from the stocking done in this way, as well as from the hatcheries. In addition to lakes named in last season's report where good results have been obtained from stocking with perch, Lake Mere, which was stocked with fifty adult perch in September, 1925, gave excellent fishing during the entire 1929 summer. This lake contained no fish prior to 1925.

Battle creek, situated in the western portion of the Cypress hills, was stocked during 1924 and 1925 with rainbow trout. It was reported a year ago that none of these fish had survived. Recently when visiting that district the supervisor was shown photographs of three rainbow trout, taken from a small stream in September, which measured 18, 18½ and 20 inches in length and weighed 11½ pounds combined weight or nearly four pounds each. These trout were taken from a small stream known as Armstrong's creek, which is not connected with Battle creek in any way and was stocked with 5,000 fry in

1925, having contained no fish before. The person showing these pictures stated that he had also caught 11 rainbow trout in Battle creek, the largest measuring 18½ inches and weighing 3½ pounds.

The secretary of the Sheep Creek Fish and Game Association reports that fish were found in the 1929 season in the upper reaches of Sheep creek above the falls, where fish were never found before, but which was stocked five years ago from the Banff hatchery. He also states that he personally saw seven cutthroat trout in one pool, and succeeded in landing one female measuring eleven inches. He is quite confident that these are the results of the stocking five years ago and are now reproducing. The four and a half pound rainbow found in the Bow river below the Carseland dam is also the result of stocking since 1919.

SIX DROWNED

Six Alberta fishermen were drowned during the winter fishing period of 1929-30. Four men were drowned in Big Whitefish lake in November, while building camp and preparing for winter fishing. The Royal Canadian Mounted Police reported one fishermen drowned in lake Athabasca. The last drowning accident occurred on Peter Pond lake where a resident of Edmonton, who was using a truck belonging to an Alberta company to move camp supplies, went through the ice with the truck.

ANNUAL REPORT OF CHIEF SUPERVISOR OF FISHERIES, MAJOR J. A. MOTHERWELL, WESTERN DIVISION (BRITISH COLUMBIA), FOR 1929

Whilst the salmon pack for 1929 shows a reduction of 634,887 cases of all varieties from that of the preceding season, this cannot be accepted as an indication of depletion. As a matter of fact this is not the case. Had the salmon fisheries of the province been administered during 1929 under the same regulations as obtained previous to three or four years ago there is no doubt that the total pack of salmon would have been increased very greatly, if not to the extent that a new record would have been established.

The object of the conservation measures which have been enforced during recent years is to prevent such large percentages of the several runs of salmon being captured and to permit of a materially larger escapement to the spawning grounds. The annual examination of the spawning ground conditions has shown that the object desired is being obtained.

It has been the custom in the past of those not understanding conditions to accept smaller pack figures from year to year as indications of depletion. The only safe method of arriving at a conclusion is to take the figures of the pack together with the quantities of fish found on the spawning grounds.

As an illustration of what is being done, the case of the Naas and Skeena rivers might be cited, where, before the salmon fishing season of 1929 commenced, the upper boundary on the former was brought down six miles and the one on the latter three miles, thereby eliminating some of the most productive gill-net drifts. Obviously, this conservation measure alone had a very considerable effect on the escapement of salmon and was partly the cause of the smaller pack. In addition, the weather conditions, in the north particularly, were the most unfavourable in the past twenty years. The days were dark, cold and wet during sockeye fishing, with the result that a considerably greater proportion of the salmon runs than usual passed under the nets and so escaped to the spawning grounds. The best fishing weather is during fine days with a little breeze.

The total pack of all varieties of salmon for the past fifteen years, arranged in five year groups, and shown in averages together with the number of licences for the several methods of salmon fishing, has been as follows:—

Period	Salmon Cannery	Salmon Gill-net	Salmon Trolling	Salmon Purse-seine	Total pack in five-year groups
1915-1919.....	80	4,902	1,805	100	cases 1,339,049
1920-1924.....	62	4,336	1,564	164	1,234,134
1925-1929.....	70	5,080	2,589	420	1,716,531

Grouping the sockeye pack figures in a similar manner gives the following results:—

1915-1919.....	334,116 cases
1920-1924.....	303,836 "
1925-1929.....	304,503 "

Conditions on the Naas, as far as the catch was concerned, were not particularly satisfactory and the conditions on the spawning grounds were found to be far from gratifying.

In the Skeena river area a better pack of sockeye was expected, but although expectations were not realized there was found to be an abundant supply of sockeye on the spawning grounds, showing that the conservation measures in this district were quite adequate.

The Rivers inlet and Smiths inlet catches were not up to expectations but, generally speaking, the spawning grounds in the Rivers inlet district were well supplied with spawning sockeye. At Smiths inlet the quantity which passed the nets was quite sufficient for reproductive purposes, although not as great as expected.

In the Rivers inlet fishing district, owing to the number of salmon gill-net licences issued exceeding that for which a forty-eight hour weekly closed season was arranged, a sixty-hour weekly closed season was enforced from July 5th to August 2nd and in Smiths inlet the sixty-hour weekly closed season was enforced during the whole season for the same reason. There is no doubt that this method of taking care of conservation is a most efficacious one.

The effect of the disastrous freshets of 1924 was very evident in both areas and resulted in a smaller percentage of five year fish than otherwise could have been expected.

The pack of sockeye taken at the Nimpkish river was unusually small but, due to conservation measures, a very large escapement reached the spawning grounds, which were most satisfactorily seeded.

In the Barclay sound area, which is becoming more important as a sockeye district each year, the pack was good and would have been considerably greater had the equipment used by the gill-net fishermen been in better condition. The fish cultural operations of the department, coupled with conservation measures during recent years, have undoubtedly materially increased the sockeye run to the Barclay sound area.

The pack on the Fraser river was unexpectedly large compared with recent years and particularly in view of the fact that the brood year of 1925 resulted in a pack of only 31,523 cases or approximately fifty per cent less than 1929. An interesting feature in this connection was the large proportion of early run fish which proceeded to the upper waters of the Fraser River watershed and were of the finest quality. These are undoubtedly either the remnant of the old runs from above Hells Gate or are the result of fish cultural operations during recent years.

It is a fact, however, that in the brood year of 1925 there was a very gratifying supply of sockeye salmon on the spawning grounds in the upper reaches of the Fraser river, particularly in the Stuart Lake and Chilco River districts. The splendid supply of early run fish in 1929 must be the progeny of the runs of these two areas as it was found that the supply of sockeye salmon to both Stuart lake and Chilco river districts was considerably greater than that of four years ago, although there was no particular run to any other portion of the Fraser River watershed above Hells Gate apart from the Shuswap Lake district, where a run arrived later in the season and reached the Adams and Little rivers.

Owing to the fact that the fishermen were not expecting such a good return so early in the season only a comparatively few nets were operated, with the result that an unusual percentage of fish passed to the spawning grounds.

If conservation and fish culture are responsible, even in part, for the runs of the 1925-29 cycle, there should be justification for the hope that, with an international arrangement looking to the rehabilitation of the sockeye runs to the Fraser watershed, great things can be accomplished.

An interesting feature of the sockeye salmon run to the Fraser river during 1929 was the unusually large percentage of three year old males. In past years this was felt by the fishermen to be an indication that the run of the following year would be an unusually good one. In the years immediately preceding what were known in the past as the big fourth year runs these small fish were very much in evidence.

The cohoe run of 1929 was one of the best in recent years. This variety was plentiful, practically all along the coast of British Columbia. The pack of 174,198 cases, as shown by Statement No. 1, is the largest since 1925 and in fact has only been exceeded three times and only then by small quantities. The following statement covering the period of fifteen years, arranged by averages in five year groups, is of interest:—

1915-1919.....	170,981 cases
1920-1924.....	110,018 "
1925-1929.....	167,397 "

The figures showing the pack of pinks since 1916, arranged in two year averages, show the production for the last two years as the highest on record:—

1916-1917.....	388,701 cases
1918-1919.....	437,191 "
1920-1921.....	356,881 "
1922-1923.....	511,455 "
1924-1925.....	551,480 "
1926-1927.....	510,303 "
1928-1929.....	635,16 "

There is no doubt that the drastic conservation measures enforced during the brood year of 1927 have been shown to have been well justified. Although in 1927, when salmon fishing along practically the whole coast was stopped, it was felt by some that the action taken was too drastic, the results in 1929 leave no doubt as to the desirability of the course adopted.

In the Fraser district, although the large run of pinks which comes in the odd numbered years is fished extremely intensively while passing through the waters of Puget sound and again when reaching the Fraser river, the supply is being well maintained.

The run to the Naas River district was not so good as expected and precautions will be taken in the cycle year of 1931 to see that there is a proper escapement.

The chum pack was disappointing to the industry. Here again, however, the figures for 1929 cannot be taken as an indication of a lack of supply. At the time this variety usually arrive in considerable quantities at the coastal streams

it was found that the runs were very small and in order to take care of conservation requirements boundaries were moved out, areas closed off and an extra close season was enforced with the result that the usual toll of the chum runs was not permitted.

On the east coast of the Queen Charlotte islands, which usually supplies a good pack of chums, boundaries were moved out in practically every bay and inlet where fishing operations were conducted, and this resulted in the salmon reaching the spawning grounds instead of being captured by the fishermen.

In the lower part of the province the season was closed early, and after fishing operations ceased very satisfactory quantities of chums arrived and passed unmolested up to the spawning grounds, resulting in a very excellent seeding generally.

In the principal seining areas on the west coast of Vancouver island, a seventy-two hour weekly close season was also enforced, owing to the allotment of seining licences set by the department being exceeded.

The following statement of the chum pack for the past fifteen years, grouped to show the average in five year periods, will be found of interest:—

1915-1919.....	31,435 cases
1920-1924.....	28,578 “
1925-1929.....	632,042 “

The following statement shows the export distribution of British Columbia canned salmon during the past five years:—

SHIPMENTS OF CANNED SALMON FROM VANCOUVER

Countries	1925	1926	1927	1928	1929
Australasia.....	255,470	331,270	257,092	269,029	307,922
Belgium.....	42,403	40,710	41,035	53,296	84,285
British India.....	5,215	1,983	1,809	2,630	2,351
Central and South America.....	27,651	22,819	31,076	90,421	53,399
Ceylon.....	125	1,130	4,222	1,200	1,748
Greece.....	3,827	23,938	14,461	685	605
China.....	6,671	90	3,993	10,035	7,448
Denmark.....	447	1,848	602	1,080	1,610
Dutch East Indies.....	7,980	9,202	14,323	4,371	855
Egypt.....	3,505	5,680	5,065	1,375	750
Fiji.....	12,959	11,889	23,363	16,386	17,680
France.....	374,176	231,601	185,295	333,670	251,075
Germany.....	2,362	1,222	5,677	19,067	40,709
Holland.....	83,425	14,866	26,786	44,340	10,653
Italy.....	58,566	102,700	168,624	40,409	136,960
Japan.....			300	140	3,043
Malta.....		1,714	2,943	535	
Philippines.....	23,177		2,000	15,690	805
South Africa.....	33,464	36,822	44,340	50,044	40,271
Straits Settlements.....	22,763	24,511	22,843	3,770	2,125
Sweden.....	250	400	224	575	800
United Kingdom.....	489,938	263,302	322,356	257,970	194,172
United States Atlantic coast.....	285	600	1,693	14,552	23,223
West Africa.....	12,359	12,015	11,207	5,033	2,792
West Indies.....	20,541	15,543	14,516	13,102	16,906
Unclassified.....	760	2,991	19,954	19,894	11,510
Totals.....	1,488,319	1,158,936	1,219,699	1,259,299	1,213,697

HALIBUT

The landings of halibut in Canadian ports since 1913 are shown in statement No. 7. It will be observed that the catch in 1929 was 304,364 hundredweights, the largest since 1926. Canadian boats caught 98,372 hundredweights, and United States boats 205,922 hundredweights.

It is apparent that the close season provided during recent years has not had the effect of materially reducing the catch of halibut.

The prices obtained by the fishermen at the opening of the season were somewhat better than those of the commencement of 1928. This was no doubt largely due to the small quantities of frozen halibut remaining in the hands of the cold storage plants at the opening of fishing.

HERRING DRY SALTED

Statement No. 8 shows a total of 916,384 hundredweights of drysalted herring. This is the fifth largest pack on record. Had it not been for the short supply on the west coast of Vancouver island it is very probable that the pack would have been near a new record. One factor which has restricted the pack somewhat in recent years is the enforcing of the definite closing date of February 5 each year. In previous seasons herring fishing was permitted until the fish commenced to spawn, and considerable quantities were taken after February 5.

Notwithstanding the intensive operations on the east coast of Vancouver island the catch is being well maintained. A feature of these operations is the seiners' practice, during the last three years, of going farther south and meeting the herring as they come around the south end of the island.

In view of the suggestion that the intensive fishing of recent years for herring might result in the depletion of the supply, the federal and provincial Departments of Fisheries have arranged for a joint investigation of the herring and pilchards by the Biological Board.

PILCHARDS

Market conditions having improved for this variety, there were 98,821 cases of pilchards canned in 1929, which is the largest pack ever put up in British Columbia, exceeding that of 1928 by 33,724 cases, as shown by Statement No. 9. The run during the year was a very good one but the fish did not come into the bays and inlets along the coast, which necessitated the fishing operations considerable distances offshore, which added considerably, of course, to the cost of production. The boats required in outside waters must be bigger and more staunchly built than those used in the protected waters, and the seines also must be stronger and more expensively constructed. The haulage for considerable distances to the plants always adds materially to the cost.

WHALING

Statement No. 11 shows a catch of 407 whales during the year. As in recent years, the whales were all taken in the vicinity of the Queen Charlotte islands and processed at one plant at Naden Harbour and another at Rose Harbour, both operated by the one company. It will be observed that the catch shows an increase of 102 whales over 1928, and is the largest catch since 1924. Three whaling boats were used out of each of the Queen Charlotte island stations.

FUR SEALS

The number of fur seal skins taken as permitted by the Pelagic Sealing Treaty amounted to 3,383 as shown in statement No. 12. This is the largest catch since 1925, when 4,465 skins were taken. In view of the fact that the average prices obtained by the hunters for skins during the year were between \$6 and \$7 there would appear to have been no particular incentive for more intensive hunting than usual. Weather conditions, however, are always reflected in the total of skins taken each year. Owing to the fact that the Pelagic Sealing Treaty permits the taking of fur seal skins by Indians only, and by means of spears while hunting from canoes, obviously an unusual amount of rough weather will result in a small take of skins.

DESTRUCTION OF SEA LIONS

Statement No. 13 shows that during the year 1,359 sea lions were destroyed in the annual hunt by the crew of the C.G.S. *Givenchy*, equipped with a Lewis gun and rifles. Of these 830 were adults and 529 pups. Owing to adverse weather conditions the operations at Solander rock, on the west coast of Vancouver island, were considerably curtailed. This is a very difficult point to approach and it is very rarely that weather conditions will permit landing. There were fewer sea lions observed in this locality than during the previous year's hunt.

On June 10 the first attack was made on the herds at the Virgin and Pearl rocks. It was found that there were more adults and pups on the Virgins than for two years and considerably more on the Pearls than for several years, the proportion of large bulls and yearlings being greater than in several seasons past.

Weather conditions at these two points were not favourable and it was necessary to make landings in heavy seas, operations which are always very hazardous. Fortunately, no accident occurred although the launch suffered slight damage.

An officer of the Biological Board accompanied the expedition this year for the purpose of examining the stomachs of the sea lions with a view to determining the variety of food therein. It was ascertained that the sea lions during the time they frequented the rookeries were not feeding and their stomachs contained only pin worms and an occasional rock.

PRODUCTION OF FISH MEAL AND OIL

By statement No. 10 it will be observed that the quantity of pilchard meal produced was the largest on record, although the 1928 total for pilchard oil was greater than 1929. This was due entirely to the fact that although the pilchards arrived in large quantities they were unusually lean which resulted in a greater supply of meal in proportion to that of oil. There were 115,523 tons of raw pilchards used for reduction purposes.

Operators were not permitted, in District No. 3, to use herring for reduction purposes and, therefore, the quantity of meal and oil shown in the statement is the result of the operations of one plant at Prince Rupert. There were 3,744 tons of raw herring used for this purpose.

In the whaling operations it will be observed that the oil rendered amounted to the large total of 712,597 gallons, which is a record for recent years. This, of course, is due to the increased catch of whales.

The balance of the meal and oil shown in the statement was obtained from halibut and salmon offal, and grayfish and scrap fish.

PATROL

There were 130 boats used in the protection of the fisheries of the province during the year. Twenty-three of these boats were departmentally owned, two of them being powered by steam and the others by gasoline or crude oil. The chartered boats numbered 107, but thirteen of these were row boats, the others being fueled either by gasoline or crude oil.

The *Malaspina* and *Givenchy*, the two largest boats, were used principally for the patrol of the three mile limit, the protection of the fur seals while passing through British Columbia waters to the rookeries on the Pribiloff islands, the protection of Canadian harbours from illegal use by foreign boats, the patrol of the halibut fishing grounds, and general assistance in the protection of all varieties of fishing, were extremely busy during the year. The *Malaspina* logged

21,579 miles and the *Givenchy* 17,911. The *Givenchy* as usual was employed for a period during the winter on the work of lifesaving with headquarters at Bamfield, close to cape Beale in the Barclay Sound area.

Two new boats were built during the year, one 45 feet long, 11 feet beam, 3 feet 6 inches draft, registered tonnage 12, equipped with a 4-cycle, 4-cylinder Thornycroft 40-horsepower reduction geared gas engine. This was to replace the *Swantail*, used on the Fraser river, which was unfit for further service. The second new boat, 45 feet long, 11 feet beam, 4 feet 6 inches draft, registered tonnage 12, equipped with 4 cycle, 4-cylinder Thornycroft 40-horsepower reduction geared gas engine, replaced the *Cloyah* which was destroyed by fire in the north.

A type of boat known as the Gypsy cruiser was built for the Babine lake patrol, with the following dimensions: Length 20 feet, beam 8 feet, draft 6 inches. The power is derived from an outboard 12-horsepower motor. The very shallow draft will permit of a maximum of efficiency in this lake section and the power arrangement should result in economical operation.

Owing to the fact that on the coast of the province there are innumerable long inlets and many streams which it is necessary to patrol by boat, it was felt that much greater efficiency could be obtained at a saving of time and expense by the employment of sea sleds. Three different varieties of sled and outboard engines were used during the year in order to ascertain which was the most satisfactory for the work required.

On the Naas river a specially constructed craft was supplied, equipped with a Lockwood outboard engine, and was found to be extremely useful in dealing with illegal fishing operations above the commercial fishing boundary. By means of this equipment these operations were very largely curtailed, and the hostility of those whose illegalities were checked was very eloquent of the efficiency of the service.

On the Skeena river a somewhat larger variety of boat was used, equipped with a Johnson outboard engine. By means of this craft the officer in charge of the Skeena river and Chatham sound operations was able to give his area more efficient attention and at very considerably less cost, since he could use the sea sled in the inside waters when the bigger boat was utilized for Chatham sound. In this way the work of two boats was done by one, and an inexpensive sea sled, and with much greater efficiency and speed.

At Rivers inlet a boat smaller in size than that employed on the Skeena was used, equipped with a Watermoto outboard engine. It was found, however, that the boat was not sufficiently staunch to stand the weather to be encountered. Arrangements will be made to transfer this boat to a more protected area.

In the Alert Bay area a sled and engine similar to that employed on the Naas were supplied to the local inspector. The sled's size permitted it to be carried conveniently on the deck of the inspector's patrol boat and he was able to obtain greater efficiency, cover more ground, and at much reduced cost, by means of this equipment. It was possible to leave his big boat at the mouth of an inlet, for instance, or have his engineer attending to some fisheries affairs, while he himself, in his sea sled, covered long distances up the several inlets in protected waters.

SEAPLANES

The seaplane service again proved to be extremely efficient in the prevention of violations of the fishery regulations. During the season 408 hours 8 minutes flying time was consumed. The latest type of Boeing flying boat was employed and gave excellent satisfaction. The inspection of spawning grounds and interior waters generally was extended during the year by means of planes, and much valuable information was obtained at a great saving of time and cost.

The air patrol is particularly valuable for localities which are inadequately served in the way of telegraph or telephone communications or by mail arrangements. On the east and west coasts of the Queen Charlotte islands, for instance, the fisheries patrol was handicapped until the flying boats were obtained. One of these boats in one week in the Queen Charlotte islands apprehended no less than seven salmon purse-seining boats for fishing inside the limits. In all these cases convictions were obtained.

Probably the greatest value of the flying service is in its moral effect in the preventing of violations. The fishermen's associations, which are showing each year a greater inclination towards working with the department's officers with a view to conservation, are very enthusiastic over the flying service as a means of preventing illegal fishing.

Statement No. 17 shows the localities from which the planes operated during the season under review, and the flying time used from each.

REGULATIONS

With a view to greater conservation and the improvement in the quality of the salmon pack, numerous inlets and bays have been, by means of regulations, removed from the fishing areas.

Certain areas have also, by regulations, been prohibited to salmon purse-seines, in accordance with the department's policy that where it is feasible for gill-netters or trollers to operate successfully such areas will be reserved for these methods of fishing.

During recent years fishing gear has increased to such an extent, and, as a consequence, fishing operations have become so intensive, that it has been found desirable, with a view to conservation and convenience in administration, to divide the commercial waters of the province into twenty-seven salmon purse-seining areas. Each one has been defined in such a manner as to embrace as nearly as possible a complete system of waterways or salmon runs, and instead of closing large areas it has been found more desirable, and just as efficacious, to deal with the one system as a unit. These areas have also been arranged so as to conform to the districts covered by each individual fishery inspector and also to conform, as far as possible, to the areas used for the collection of statistical information.

As a further means of control of the salmon seining, primarily, to each area has been allotted a number of purse-seines which, in the opinion of the fisheries administration, is ample in view of the apparent supply of fish running to the area, and always having conservation in view.

It is a fact that under the department's policy no properly qualified person is refused a salmon purse-seine licence, and further, there is no restriction as to the number of seining licences which may be taken out or operated in any area, but the control is in the arrangement whereby, if the allotment in any one area is increased by even one licence, the weekly closed period for that area will be increased from the normal time of forty-eight hours to seventy-two hours. During 1929 this plan was found to be a very potent factor in reducing excessive fishing in most of the areas and with the experience of the past year it is felt that the system will work to even a more useful degree in the future in the interests of conservation and control generally.

It must also be remembered that, in addition, there always exists the authority vested in the fishery officers, by regulation, to cut off any areas necessary by means of moving fishing boundaries or to close all fishing should conditions warrant. Such authority is exercised without hesitation when necessary.

As an evidence of the effectiveness of the method of moving commercial fishing boundaries farther down towards the mouths of streams, it is interesting to note that the Indians along the Skeena river, above the commercial fishing boundaries, reported during the year the greatest run of spring salmon observed in the last twenty years. Obviously, this was the direct result of lowering the boundary on the Skeena three miles and eliminating some of the drifts in the narrow parts of the river which effectively prevented the proper escapement of salmon.

Very similar conditions were found on the Naas river where the boundary was lowered six and a half miles at the commencement of 1929.

In Seining Area No. 2, which comprises all the southern portion of the Queen Charlotte islands from Skidegate south, with a view to proper protection of the runs of chums particularly, which had shown some signs of depletion in the past, the fishing boundaries were moved out at practically all points where salmon seining had been found profitable in previous years, with the result that, notwithstanding a considerable number of seines operating during the year, the catches were small. The action taken was undoubtedly responsible for the better seeding of the spawning grounds.

VIOLATIONS OF THE FISHERY REGULATIONS

During the season there were 160 convictions obtained for violations of the fishery regulations, as compared with 176 in the previous year. Particulars are given in appendix No. . The total revenue collected as a result of these violations amounted to \$6,314.31.

Included in the list of convictions were those of three foreign boats prosecuted for illegal fishing inside the territorial waters of Canada. There were five cases of prosecutions of foreign boats illegally using Canadian harbours. No convictions were obtained in any of these cases, the court holding that the evidence was insufficient.

In view of the considerable increase during recent years in the size of the foreign salmon trolling fleet operating off the shores of British Columbia considerably more attention has been necessary to the protection of Canadian harbours. There are a great many of these shelters in the numerous inlets, and on the islands along the coast, and since the coast is so sparsely populated, foreign boats have undoubtedly been making greater use of Canadian harbours than they are entitled to do. It is only by constant patrol with suitable boats that these violations can be detected, and even when boats are apprehended convictions are difficult to obtain owing to the numerous excuses in the way of alleged damaged engines, illness and unsuitable weather for the particular class of boat, etc. It is felt, however, that the seizures made during 1929 will have a decidedly good effect, and it is hoped that in future seasons this difficulty will be largely overcome.

SPORT FISHING

The year under review was a satisfactory one from the standpoint of sport fishing. Some excellent angling has resulted from the stocking of lakes and streams by the department with the several varieties available in the province, which include the Kamloops trout, Cutthroat trout, Eastern Brook trout and Steelhead trout. There is no doubt that the efforts being made by the department in the way of restocking streams and lakes are well justified, and they are certainly much appreciated by the anglers.

During the year 237 plantings of eggs and fry of the sport varieties of fish were made in streams and lakes of the province which were in need of stocking.

STRIKES OF FISHERMEN

During the season the following strikes occurred amongst the fishermen:—

At Bella Coola spring salmon gill-netting commenced on May 30 and continued until June 4. Owing to a disagreement over prices received, fishing ceased on the night of June 4, but after one day's idleness the fishermen resumed operations, although no definite decision had been reached with regard to prices.

In the Shushartie district the salmon trollers, on July 1, ceased fishing operations as they were not satisfied with the prices paid for the spring and coho salmon being taken at that time. Fishing operations were resumed on July 6.

In the pilchard fishery on the west coast of Vancouver island the purse-seiners remained ashore on August 7 owing to the fact that they felt they should receive \$4 instead of \$3 per ton. Their demand was met by the reduction plants and canners, and fishing resumed the next day.

DEFORESTATION-SALMON

During the year conditions have been found unusually difficult for the ascent of salmon in certain logged-off areas as the season was the driest experienced in certain parts of British Columbia in the last twenty years. The lack of rain increased greatly the difficulties in protecting the salmon runs to some districts.

Unless and until some program has been arranged in the way of reforestation it would appear that the only way to maintain the runs of salmon to a number of the streams in question is by means of fish culture, and the difficulties even in this method would be great in view of the number of streams affected and their small size.

FISHERMEN'S ORGANIZATIONS

One interesting development in the last three years, and during 1929 particularly, has been the effort put forth by the fishermen with a view to organizing in such a manner as to include all the fishermen on the coast. During the past season greater results in this way have been obtained than ever before and it is expected that in the very near future practically every fisherman will have an opportunity, through his own association, of doing his part towards bettering fishing conditions.

By means of the fishermen's associations much closer contact can be maintained between departmental officials and those actually conducting fishing operations. The result is very helpful to all concerned and in view of the repeated statements of the fishermen's officials that they are eager to co-operate with the department in the conservation of the fisheries of the province much is expected of the move.

SALMON FISHING EXTRA-TERRITORIAL WATERS

In the past two years several of the British Columbia canning companies have conducted salmon seining operations in extra-territorial waters, in the vicinity of Swiftsure banks at the entrance to Juan de Fuca straits. These operators come into competition with numerous foreign seiners and very large quantities of salmon are captured in this way, the greatest percentage, of course, being landed at ports in the state of Washington. The Canadian deliveries are made at Barclay Sound points.

In view of the immaturity and otherwise undesirable condition of these fish captured on their feeding grounds and the small value to the fishing industry, compared to those which would result were the fish permitted to complete their feeding and come into the territorial waters where they are in infinitely better condition for canning and food purposes generally, it would seem eminently desirable that some measures be taken without delay with a view to the prohibition of fishing in the vicinity of Swiftsure banks. It is felt that such prohibition

would be well justified as the salmon later would have reached a larger size, would be in very much better condition, and would be of much greater value to the industry and the public generally.

DESTRUCTION OF HAIR SEALS

Each season the fishermen press for some action to be taken to the end that the hair seals may be exterminated, or at least very materially reduced. It has been proved beyond a doubt that these mammals destroy very large quantities of salmon and will at times become entangled in the gill-nets, causing the fishermen very considerable loss. The fishermen complain that often upon hauling their nets they will find nothing left but numerous salmon heads, the rest of the fish having been taken by the hair seals.

This menace is particularly annoying in the Fraser river, Skeena river, Naas river, and Rivers and Smiths inlets.

Many methods have been tried with a view to the destruction of the hair seals, but none has been devised which promised any real success.

Owing to the fact that these mammals do not gather in large numbers at any known rookery at breeding time, as in the case of the sea lions, it is not possible to adopt the same methods as used in dealing with the latter menace.

Statement No. 18 gives particulars of the amounts paid each year by the department in the way of bounty for the destruction of hair seals, together with the number on which the bounty was claimed each year. There is no doubt that the bounty system is the most efficacious one for the purpose of reducing the seal menace.

MEETINGS WITH FISHING INDUSTRY

During the year numerous meetings have been held with the fishermen's organizations, as well as with the canners. Much good results from this constant close contact and it is the intention to continue and encourage such contacts with the industry.

It is the department's policy that just as far as is possible the industry will be advised each fall as to what it may expect in the way of amendments to the regulations or changes in departmental policy covering the following operating year. The intention is to hold one meeting each fall at which every branch of the industry will be represented by one or two officers, instead of holding a mass meeting at which it is difficult to reach any real conclusion. While all fishery officers are at all times very willing and eager to meet fishermen and canners, at the same time it will be appreciated that in any large gathering it is not possible to obtain the results which are to be desired from a meeting such as proposed above.

STAFF

The promotion of Mr. A. J. Whitmore, who had for several years been occupying the position of head clerk in the Vancouver office, to an important position at headquarters has enabled the organization generally to be greatly improved. His experience in British Columbia will surely be found helpful at headquarters when dealing with Pacific coast affairs.

As the fisheries of the province have been extended, more guardians have been employed from time to time, and in certain localities it has been necessary to keep these officers on duty in recent years twelve months in the year. Owing to the irregularity of such procedure, from the standpoint of the Civil Service Commission requirements, and with a view to obtaining the services permanently of capable and experienced men, it was found necessary to make these positions permanent ones. In addition, due partly to the extension of fishing operations in District No. 2 and also to the resignation of one officer and the transferring of several others, it has been found necessary to make five entirely new appointments of inspectors. Applications were called by the Civil Service Commission for a total of thirteen positions.

The peak number employed in the administration of the fisheries of British Columbia during the year was as follows:—

Inspection and clerical staff.....	46
Guardians.....	37
Patrolmen and boat crews.....	188
Fish culture.....	73
	<hr/> 344

OBITUARY

In the passing during the year of Supervisor A. P. Halliday at New Westminster, the department lost one of its most experienced and keenest fishery officers. Mr. Halliday joined the service in New Westminster on December 1, 1904, and in the way of energy, keenness and hard work, generally, gave all he had to the service.

Mr. W. R. Johnson, a member of the Babine Lake Hatchery staff, was also lost to the service through an accident which occurred while he was riding back to the hatchery from a short period spent at Burns lake.

MEETING OF FISHERY OFFICERS

Again this year all the permanent fishery officers were gathered together at Vancouver before the fishing season started in order that all matters pertaining to the season's program might be discussed. There is no doubt that this annual meeting is of very great assistance to the officers in the understanding of their duties, and to the department in the way of obtaining closer contact with those administering the fisheries throughout the province.

INDIANS—SPAWNING GROUNDS

The Indians of the province have always been more or less dependent for their food on the salmon and it has been their custom, particularly in the upper reaches of such systems as the Skeena and Fraser rivers, to capture very considerable quantities of salmon on the spawning grounds each fall and cure them by their own methods for the purpose of food for themselves and their dogs.

In recent years the necessity for taking such a large toll from the salmon runs has become less apparent, due to the fact that, on the coast, particularly, the Indians are able to compete with whites on a fairly equal basis in such occupations as commercial fishing operations, employment in shore fishing establishments, stevedoring, logging and similar occupations. The result has been that those on the coast, apart from the older ones, do not require the same amount of salmon. The situation in the coast areas is becoming more satisfactory each year in this connection and can be satisfactorily handled. It is the large quantities, particularly of the valuable sockeye variety, taken above the commercial fishing boundaries which are the cause of considerable concern, particularly in view of the fact that most of these fish are captured practically on the spawning grounds after they have passed the many natural dangers and obstructions as well as the nets of the fishermen on their way up the many miles of river to the spawning streams.

In the Naas River area the salmon landed by the Indians are, as a rule, not taken actually on the spawning grounds, but are captured after having passed the commercial fishing boundary. A very large percentage of those taken in the Skeena and Fraser watersheds, however, are actually from the spawning creeks. At Babine lake and river, headwaters of the Skeena river system, new nets are supplied to the Indians by the Department of Indian Affairs every second year. The run has always been sufficiently large in that district to permit of an ample supply being obtained each year.

In the headwaters of the Fraser river, however, at Stuart lake particularly, there have been several seasons when the run was so poor that the Indians have

not fished. In these areas the Indians found other means of obtaining a food supply, and, as a matter of fact, during recent seasons they have devoted more time apparently to haying operations. During the season of 1929 there was an exceptionally large run of sockeye salmon to the Stuart Lake area. Of this run the Indians are estimated by the local officer to have taken 10,052. In view of the efforts being made by the department to restore this valuable run to the Fraser watershed it is regrettable that such a heavy toll should have been taken.

In the years of the good runs the percentage taken by the Indians obviously is not so serious as that during the smaller runs.

There is, of course, another side to the question and the position of the Indians must be appreciated. Before the commercial fisheries assumed such large proportions there was no question as to the propriety of the Indians obtaining all the salmon they required in any manner they wished for the purpose of food for themselves and their dogs. In view of the intensive commercial fishing which has developed of recent years, and the greatly increased value of salmon, the operators feel that the catch of the Indians, on the spawning grounds particularly, should be curtailed if not discontinued entirely, but they realize that some adequate measures should be taken to the end that the Indians may not suffer. Several suggestions have been made to meet the situation, such as the substituting of canned pilchards or salmon put up by other methods at the coast and shipped to the Indians. No concrete proposal, however, agreeable to the Indians has yet been forthcoming, but it is understood to be the intention of the salmon cannery to suggest some form of co-operation with the fishery administration with a view to the substitution of some other suitable variety of food and the non-interference with the salmon.

The numerous anglers who fish in the Stuart Lake area are also objecting to such large quantities of trout being taken by the Indians.

It is interesting to note that by the last census there were found to be 27,720 Indians in British Columbia, and the officers of the Department of Indian Affairs estimate that 11,488 of these engage in the several branches of the commercial fishing operations, but that there are 13,232 who claim the privilege of taking fish for the purposes of their own food.

Statements Nos. 19 and 20 show the number of the several varieties of fish estimated to have been taken during the year 1929 by the Indians from the areas above the commercial fishing boundaries.

CLEARING OBSTRUCTIONS IN STREAMS

During the year work was performed on twenty-five different streams in the province with a view to making it possible for the salmon to ascend to their spawning grounds without difficulty. The amount spent in this connection was \$5,363.44.

In several parts of the province the rainfall was so light as to result in the worst conditions experienced in the past twenty years. Obviously, log jams or other obstacles in the way of rocks or steep inclines which, under normal conditions would not hinder the passage of salmon, were, due to the above-mentioned conditions, found to be real obstacles. As is usual, every case coming to the attention of the fishery officers, either as a result of their own investigations or through the co-operation of the fishermen or cannery, received proper attention and any necessary work was performed at the most suitable time.

More and more attention is given each year to the question of obstructions in streams and the inspection of streams generally, and as a result of the contemplated appointing of a number of new inspectors it is expected that even better results will be obtained.

MEMORANDUM AS TO SPAWNING CONDITIONS, 1929

*District No. 2**Queen Charlotte Islands*

Nineteen hundred and twenty-nine was the "off" year from the standpoint of pink salmon. It is only in the even numbered years that a large and very excellent run of this species reaches the streams on the north and east coast. In the odd numbered years, while there is a small run, it is nothing compared with the big year. During the season just closed conditions on the spawning grounds were found to be normal.

In the case of the chums, there is a run particularly along the east coast of the islands every year. It has been felt that, due to intensive fishing and dry weather during recent years, possibly the supply was becoming more or less depleted. This being the case unusual precautions were taken in the season just closed in the way of moving fishing boundaries in such a manner as to make inaccessible to the fishermen a majority of those areas which have been found to be most productive in past years. As a consequence the pack has been small but an examination of the spawning beds proves beyond a doubt the effectiveness of these conservation measures. The streams, speaking generally, were well supplied with spawning salmon and this would not have been the case had the unusual measures in the way of conservation not been taken.

It is the intention to watch the Queen Charlotte island streams closely and give them what protection is found necessary in order that there may be no depletion of any variety of salmon.

Naas River Area

The usual inspection was made by our own officer, accompanied by the Provincial Inspector of Fisheries, of the Meziaden district particularly. In addition, an inspection was made by the fishery officer from Smithers of the Blackwater river, which, owing to the difficulties of the trip and there being no competent officer available, has not been properly inspected heretofore.

We have also had a more comprehensive inspection made during the past season of the lower reaches of the Naas river itself. This has been impossible in the past, owing largely to the fact that there was not available an experienced officer for this difficult trip.

Generally speaking, the results show a considerable increase in the run of sockeye over the previous year but both officers who inspected the Meziaden district, which is the most productive from the standpoint of sockeye, agree that the run was but two-thirds of that of the brood year of 1924. The fishway was found to be in excellent working condition.

In the past it has been felt that the very large percentage of sockeye were the result of the spawning in the Meziaden district, but following this last season's inspection there would appear to be good reason to believe that there are other portions of the watershed which have been considerable factors in the run and the Meziaden district can be no longer considered the only spawning area of real importance.

The supply of springs and cohoes was no better than the average. This was an off year for pinks. The chum run was rather light.

At the beginning of 1929 the fishing boundary was lowered six miles towards the mouth of the river and it is felt that in future years this conservation measure will show the wisdom of this measure.

Skeena River Area

The sockeye spawning area nearest to salt water is Lakelse lake and its tributaries. The run of sockeye to this district was good, comparing favourably with that of the brood year of 1925, the Lakelse lake sockeye being four year olds. In 1925 there were two very severe freshets during November and December which caused considerable damage to the principal spawning streams,

Williams and Schullabuchan creeks. Had it not been for these freshets it is felt that the supply of sockeye would have been exceptional. Unfortunately, similar freshet conditions prevailed during the present fall, three being experienced, and it is feared that there has been considerable damage to the naturally spawned eggs in the two main tributaries to Lakelse lake.

The hatchery superintendent reports that the run of pinks to the Lakelse area was the largest on record in the memory of the old time residents of the district.

The supply of cohoes was well up to the average.

The spawning areas of the Bulkley river are undoubtedly a considerable factor in the runs of salmon to the Skeena district. Unfortunately, due to lack of qualified men in the past, it has been impossible to obtain a thorough inspection of this area. It is hoped that next season the facilities will be available which will enable this very necessary inspection to be performed efficiently. The local guardian at Hazelton stated, however, on July 28 last, that the largest run of sockeye for years was at that time ascending the Bulkley river. There is no doubt that a very satisfactory quantity passed up this stream to the spawning grounds.

The main spawning areas of the Skeena River watershed are Babine lake and its tributaries, together with Babine river. The usual inspection was made this year by experienced, competent officers, who all agree that all the creeks, without exception, were well seeded with sockeye and that the prospects for a good return in the seasons of 1933 and 1934 are excellent, particularly in the latter year, as it is estimated that the great percentage of the run this year is composed of five year fish. The local provincial officer, who has made many inspections of the Babine watershed, states in part as follows: "From my own observations of the Babine river I would say that the sockeye run this year was a big one and equal to the best year I have seen."

The same officer suggests that so large an escapement this year can only be attributed to two or possibly three factors, as follows:—

(1) The extended weekly close season which the department enforced on the Skeena river gill-net fishing; (2) The unusual weather conditions and clear water causing the fish to swim deep. (The weather during the sockeye season was most favourable experienced in the last twenty years and undoubtedly a big factor in the success of the catch); (3) The three mile shortening of the fishing boundary.

The supply of spring salmon was fairly good and better than for several years.

The pink run was reported as being the largest seen in the Babine and is another evidence of the beneficial effect of the conservation measures taken in the middle of the pink fishing season of 1927 when it was found necessary to close fishing entirely for a period.

The supply of cohoes has not been particularly good. It is evident that the conditions found on the Skeena and Naas in connection with the coho run are influenced to a very considerable extent by the intensive salmon trolling operations by both the Canadian and foreign fleet between the International boundary on the north, and Goose islands, as well as about the Queen Charlotte islands. This no doubt also very materially affects the run of springs. It is felt, however, that the lowering of the boundary on the Skeena will probably be even more beneficial to the springs than to the other varieties.

The Indians, as usual, have taken a large quantity of sockeye salmon from the Babine district and have also destroyed a large number of pink salmon which have got in the nets used for taking sockeye but which they do not want.

Central Area

Weather conditions during the season in the Central area were very favourable to the ascent of salmon to the spawning grounds. Heavy rainfall during June, July and August kept all streams well supplied with water.

The sockeye streams are generally well seeded.

Cohoe streams are also well supplied with spawn of that variety.

In the case of the pinks there is no doubt that the drastic measures taken in 1927, the brood year, resulted in the saving of the pink run to the Central district. In 1929 spawning streams of this area were found to be satisfactorily supplied with this variety.

Springs and steelheads do not frequent the streams in this division to any extent.

In the case of chums, the spawning has been satisfactory, and much better than would have been the case had there not been unusual restrictions placed on the fishing in the way of closing certain areas by means of moving the fishing boundaries.

Bella Coola and Kimsquit Areas

An inspection of the Bella Coola river spawning conditions showed that there was a considerable increase in the quantity of sockeye over the previous year and the supply is reported to be greater than usual.

There was a fair run of spring salmon.

The coho supply also appeared to be satisfactory, although the date of inspection was rather early to obtain complete results. It is felt, however, that in this area, as well as in practically all others in British Columbia, the supply of cohoes was entirely satisfactory.

The pink run is reported to have been a heavy one and almost as great as the preceding season, which was unusually big.

Speaking generally of the Bella Coola river there is no doubt that conditions found this year were entirely satisfactory.

In the case of Kimsquit river, there is evidence that the run was an encouraging one. The Kimsquit is never a particularly good spring salmon stream but the average quantity was found on the spawning grounds. The coho conditions were found to be very similar to those on the Bella Coola river. The pink supply was small, but it must be remembered that the pink run to the Kimsquit river has never been large. Evidently there was a fair escapement.

Rivers Inlet District

Speaking generally, there was a good escapement of sockeye salmon to the Rivers Inlet area, although the streams at the head of Owekano lake were found to contain fewer fish than was hoped for.

The feature of this year is that it was noticed that the streams with the best spawning facilities had the largest supply of sockeye salmon. This applied particularly to the Waquash, Genessi, Quap and Dallack rivers. The Indians reported a second large run of sockeye to the Waquash and Indian rivers following the first inspection of the fishery officers. The superintendent of the hatchery at Rivers inlet states that he would assume that the run has been above average and considerably greater than the run of the preceding year. It will be remembered that in 1924 there were unusually severe freshets in the Owekano Lake district which did a considerable amount of damage to the spawning grounds. This was reflected in the run of four-year fish in 1928 and again in the five-year fish in 1929.

The run of coho salmon in the Rivers Inlet area this year was a good one.

The supply of chums was also found to be very satisfactory.

The condition of the streams in the Rivers Inlet area from a standpoint of obstructions was found to satisfactory. There are no obstructions preventing the ascent of salmon. There is, however, an old log jam at the mouth of the Waquash river but it has not prevented the salmon from proceeding to the spawning grounds. This is evidenced by the large quantities found above the alleged obstruction. This season two inspection trips were made by the fishery officer in order that the fullest possible information might be available.

Smiths Inlet area

Two inspections were made of the Smiths Inlet area by the federal officers, the former on September 20 and 21 and the latter on October 6. The first inspection showed few sockeye in the two main spawning streams, which are the Geluck and Canoe rivers, the Geluck being considerably the larger stream and the favourite spawning ground. The water was very low but an examination of the beach along the lake showed considerable bodies of sockeye breaking water near the mouths of the streams and apparently waiting for suitable conditions before ascending.

The second trip showed greatly improved conditions. The number of sockeye seen was found to be slightly, if anything, below the average in numbers. In this area, as in Rivers inlet, extra weekly closed time was enforced during the season, and that action, together with the unusually difficult weather conditions, resulted in a larger proportion of the run ascending to the spawning grounds than would have otherwise been the case.

In this area, as in Rivers inlet, the effect of the severe freshets in 1924 was evident but with the quantity of sockeye found on the spawning grounds there is every reason to expect a satisfactory return in the cycle years.

There were no obstructions found in either the Geluck or Canoe rivers which would prevent the salmon reaching good spawning grounds.

This is not a prolific pink and chum area, but the 1929 runs were normal, as was the case with the springs and cohoes.

Alert Bay Area

At the Nimpkish river, which is the chief salmon stream in the Alert Bay area, the escapement of sockeye to the spawning grounds, notwithstanding intensive fishing and a small pack, was excellent. Sockeye commenced to run on May 10 and continued to the middle of August. Weather conditions during July interfered undoubtedly with the catch by purse-seines, and the extra weekly closed season enforced permitted extremely satisfactory quantities to pass up the river.

The local officer reports a very good run of the fall varieties.

At Glendale cove there is usually a very good run of sockeye and pinks. Sockeye run in 1929 was fair compared to other years, but the run of pinks was unusually large.

Large catches of pinks were made at Bond sound, but although the run to Thompson sound was excellent the closing of this area permitted all the fish to ascend to the spawning streams.

The local inspector states that he observed during the season more salmon in the streams than in any previous year since 1924, and he states that this condition is the result of closing areas to fishing and the moving out of fishing boundaries.

The run of cohoes particularly has been remarkably good in this area.

Quathiaski Area

There are only two points to which sockeye run in this area. These are Hayden creek and Phillips river. At both these points the supply on the spawning grounds was good and in fact the local officer states that the grounds were never better seeded.

This was an "off" year for pinks in the Quathiaski district and no big run was expected. Conditions, however, were quite normal.

All the coho streams were well seeded.

While at some points the run of chums was very heavy, generally speaking the run was not quite up to normal, but the seeding was apparently satisfactory.

The seeding of springs was remarkably good.

Pender Harbour District

The only sockeye stream of any importance in the Pender Harbour district is the Saginaw river. More sockeye were observed in 1929 than during the previous brood year.

The supply of pinks was found to be most gratifying and compared favourably with the cycle years of 1925 and 1927, except in Theodosia arm.

The coho spawning grounds were well supplied and the fish ascended all streams usually used by them in as large numbers as in the four years previous, and in some instances greater numbers.

The quantities of chums found on the spawning grounds were quite satisfactory.

Comox District

The Comox area is primarily a fall salmon district. The supplies of the various varieties were normal, but the fish had difficulty in ascending to the spawning grounds, owing to lack of water in the several streams. Many were observed to be spawning practically at the mouths of the creeks.

This has been the "off" year for pinks, but for an "off" year the run was a very good one to the Puntledge and Tsolem rivers.

A heavy run of chums ascended the Big Qualicum river and the spawning grounds there should be well supplied.

Cohoes were abundant in most of the streams in the district, although they arrived later than usual, no doubt owing to the low water conditions.

Nanaimo-Ladysmith District

In the Nanaimo and Chemainus rivers the run of chums and cohoes was quite satisfactory. Some of the smaller streams, however, were very low and the spawning conditions were not satisfactory. This condition will be watched in the cycle year.

Cowichan District

The principal streams in this area are the Cowichan and Koksilah rivers. In the Cowichan one small run of springs arrived about the middle of August, another about the middle of September. Owing to the most unsatisfactory water conditions in the last twenty years, the fish found great difficulty in passing up beyond Skutz falls and in fact very few of them got beyond the obstruction, which in the past has not prevented salmon from ascending. It appears that the supply of springs to the Cowichan river during 1929 has been the poorest for some years.

The supply of cohoes was well up to the average, but these fish also were obstructed at Skutz falls. As in the case of the springs, a number would naturally spawn between the falls and the mouth of the river as there is quite an extent of suitable spawning ground. Quite a number, however, undoubtedly died without spawning.

The run of chums was exceptionally heavy, and remarkable for the fine condition and size of the fish. The seeding by this variety was most satisfactory.

In the case of the steelhead trout an excellent run was observed to the spawning grounds.

Rainbow and Cutthroat trout have been plentiful during the year, many fishermen mentioning to the local officers that it was one of the best seasons they had experienced.

No evidence was seen to indicate that the attempt to stock this area with Atlantic salmon has been successful.

Steps are under consideration to overcome the difficulty at Skutz falls by the construction of a suitable fishway.

Water conditions on the Koksilah river were difficult and the seeding of that river was poor.

It is worthy of comment that there are no commercial fishing operations permitted anywhere near the mouths of the Cowichan river or Koksilah river, and the fish have as a rule very little interference.

Victoria District

There are few salmon streams of any importance in the Victoria district, apart from the Goldstream river. The local officer reports that an unusual

run of coho ascended to the spawning grounds of this stream and a fair run of chums. In the opinion of the officer the runs of the cohoes and chums to the Goldstream were the best he has seen in the district.

Sooke—Port Renfrew District

The supply of salmon of the fall varieties entering the few streams in the Sooke district was hardly up to the average.

In the case of Port Renfrew there is usually a good run of coho salmon to the one river. This run apparently is being fairly well maintained, although in future the fishing boundary will be placed farther out from the stream.

Nitinat District

Nitinat is primarily a fall salmon area. The inspecting officer reports that there are five streams of importance in the district and all have been well seeded. This has reference to the springs, cohoes and chums.

In order to build up the early run of chum salmon steps are being taken to prohibit fishing until October 1st each year.

Barclay Sound District

The sockeye streams in the Barclay Sound area are those flowing in at the head of Uchucklesit arm and the Sproat and Stamp rivers at the head of Alberni canal. The runs this year were unusually good. Sockeye commenced to arrive in the Stamp river about May 1 and continued through to the middle of October. The spawning beds of the Great Central lake and Ash lake districts, to which the sockeye ascend by means of the Stamp river, were found to be well seeded.

The fishway at Stamp falls is proving a great success and fish have absolutely no difficulty in passing the obstruction, which, previous to the installation of the fishway, was found so difficult, and at times impassable.

The supply of sockeye to the Sproat and Somass rivers and Sprout lakes was found to be similar to that obtaining in the Great Central lake area.

In the stream entering into the head of Uchucklesit harbour the run was found to be the best since the hatchery was established at the head of Anderson lake. While it is difficult to make any accurate estimate of quantities of salmon unless they are actually caught and handled, the local superintendent calculates there were probably 135,000 sockeye reaching Anderson lake this season, as against 70,000 last season, 75,000 in 1927 and 65,000 in 1926. The spawning conditions here were good.

The catch of sockeye was small in the Barclay Sound area owing to there being fewer gill-net fishermen operating and also due to their using poor equipment.

The run of springs to the area generally was found to be better than usual and, in fact, the local inspector states that the quantities of this variety appear to be increasing each year.

In the case of the cohoes, there is also a very excellent supply and a heavy escapement to the spawning areas.

The chum run did not equal that of 1927 or 1928, but was greater than in 1926 and about equal to 1925. While the supply this year undoubtedly showed the effect of the low water conditions and dry season of 1925, yet there was an adequate escapement to the spawning grounds. The spawning grounds of the Nahmint river, however, were later badly scoured by freshets.

In the case of the Toquart and Sarita rivers, which are fished quite intensively, the runs in 1926, 1927 and 1928 were heavy. These streams seem to have suffered somewhat from the low water conditions as explained above, but will receive attention when the cycle year arrives again.

Clayoquot Sound District

There is a small run of sockeye to the Midgeon river and the supply is being maintained. Owing to the run's early arrival it has not been fished to any extent. The main source of sockeye is the Kennedy lake and river. The salmon arrive at the mouth of the river early in the season but usually remain there a number

of weeks, playing about within two or three miles from the mouth. In view of the intensive fishing during recent years it has been found necessary to keep the fishing boundary well out, notwithstanding the strenuous protests of the salmon purse-seine operators. This season a very excellent supply was reported inside the fishing boundaries and the first reports from the spawning areas were to the effect that there was a most satisfactory run. The later reports, however, modified this statement somewhat, but there is no doubt as to there being a very satisfactory seeding. The necessity for maintaining an effective fishing boundary, however, has been demonstrated by the results of the last two seasons operations particularly.

The chums run in larger numbers to the Clayoquot are than any other variety and the spawning grounds show a good seeding.

Nootka District

There is a small run of creek sockeye to the Nootka district area and steps are being taken in the way of moving boundaries farther out to the end that the runs may be increased.

Spring salmon were plentiful and as no operations were conducted for this variety in the sound all the fish passed safely to the spawning grounds.

The coho supply is reported to be not so satisfactory, although probably sufficient for a reasonable seeding.

This is not a pink salmon area.

Practically all the chum salmon streams were well seeded. These fish seem to have come in fairly late but arrived in good quantities.

Kyuquot District

The supply of creek sockeye was found to be fair only in the Kyuquot district. This is, of course, not a sockeye area apart from a few of the creek variety arriving each year.

The run of springs was not more than fair.

The coho run was also reported to be light.

In the case of chums it was felt that there might be a short run, so the fishing was closed considerably earlier than usual to permit what fish were available to go to the few spawning streams there are in this area. It is felt that there will be sufficient for a reasonably good seeding.

Quatsino District

This is not a sockeye area, although a few of the creek variety arrive each year. These fish are receiving special attention with a view to increasing the run.

The supply of springs is reported to have been very heavy in Marble creek, which is the principal spawning stream of the district for this variety.

There was a good run of cohoes to Marble creek and in the stream flowing in at the head of Rupert arm; in fact, the coho supply generally was good.

The spawning areas were well seeded with chums in the whole area.

Fraser River District

The outstanding feature of the run of sockeye salmon to the Fraser system was the escapement of exceptionally large quantities to the spawning grounds of the Stuart lake district. These fish arrived on the fishing grounds before there was much fishing equipment in the water and the percentage escaping was consequently very large. The numbers observed in Stuart lake district were greater than for the past fifteen years, at least. They scattered to a large number of tributaries of the Stuart area. These are either the remnant of the old big year on the Fraser, which would have been due in 1929, or the result

of planting eyed sockeye eggs in the tributaries of Stuart lake and the utilization of two small lakes in the vicinity of Stuart Lake hatchery as large retaining ponds. Possibly all three are factors in the resultant good run this year.

Another unlooked for condition was found in the Chilco lake area where it is estimated that 70,000 sockeye spawned in the river just close to the lake. It is many years since any appreciable number of this variety of salmon have been observed in this district.

The conditions in the Bowron Lake area were not encouraging and this also applies to the Quesnel district which years ago was such a prolific sockeye area.

At Shuswap probably 30,000 or 40,000 spawning sockeye reached the spawning grounds at Adams river and Little river. Practically all these were permitted to spawn naturally.

At Harrison lake only a small return was found this year.

It was not expected that any large number would return to Cultus lake in 1929 and it is estimated that the hatchery, after spawning all the fish arriving, will take in the vicinity of 10,000,000 eggs.

At Pitt lake the run of sockeye is being at least well maintained. Year after year conditions at this point have, if anything, improved. A pleasing feature in this district was an unexpectedly large run of sockeye to the Allouette river. The fish were permitted to spawn naturally.

In the Birkenhead district the run of sockeye was not quite as large as usual; 18,000,000 eggs were taken. These are all being retained in the district.

In connection with the run of salmon to the upper Fraser it is pleasing to note this year that the water conditions at Hells Gate were such as to permit of all salmon passing with the minimum of inconvenience.

The supply of spring salmon found on the spawning grounds was not more than an average.

In the case of the cohoes the situation was very similar to that in the case of the springs.

This being the "big" year for pinks the run was found to have been well maintained and very large quantities were found on practically all spawning beds. The pack on Puget sound, through which most of the pinks run coming to the Fraser river, together with that on the river itself, was unusually large, but notwithstanding this the spawning conditions were found eminently satisfactory.

In the case of the chum salmon the run cannot be considered anything more than an average run.

General

Taking the province as a whole, the conditions on the spawning grounds of practically every variety of salmon have been found to be quite satisfactory. In the case of the sockeye, the pack was somewhat smaller than expected, but this was not due to a lack of fish, but to conservation measures and weather conditions. The run of cohoes has been unusually good. The springs were a fair average.

The run of pinks showed that the drastic action taken in 1927, when practically the whole province was closed for a period, was well justified. The supply this year was most gratifying.

The pack of chums was very much smaller than expected, but this again was not so much due to there being a shortage of fish, but was largely owing to the drastic measures taken in the way of conservation. These included the late starting of fishing in certain areas, the early closing in a number of areas, the extension of the weekly close season, and the moving out of fishing boundaries to such an extent that bays and inlets which in the past had been great producers of chum salmon were cut off entirely from fishing. The result has been that the spawning requirements have been taken care of well.

1907.	58	.....	.....	.....	314,074	23,159	.....	2,939	.....	683	87,900	118,704	(Pks. & Ch.)	547,459
1908.	52	.....	.....	.....	355,023	25,433	.....	2,731	.....	1,137	81,917	76,448	(Pks. & Ch.)	542,689
1909.	72	.....	.....	.....	840,441	18,218	.....	799	.....	.....	61,918	46,544	(Pks. & Ch.)	967,920
1910.	58	.....	.....	.....	565,915	19,313	.....	9,476	.....	.....	74,382	34,613	.....	762,201
1911.	59	.....	.....	.....	383,509	38,751	.....	9,705	.....	140	119,802	305,247	.....	948,965
1912.	57	3,640	92	139	444,762	62,345	.....	18,092	.....	.....	165,309	247,743	.....	996,576
1913.	78	4,782	74	124	972,178	37,433	.....	3,616	.....	.....	69,822	192,887	.....	1,353,901
1914.	63	4,857	61	107	536,696	32,908	.....	16,420	.....	.....	120,201	220,340	.....	1,111,039
1915.	63	4,951	61	109	476,042	51,734	.....	6,370	.....	2,927	146,956	367,352	.....	82,000
1916.	72	4,600	80	115	214,739	51,231	.....	15,495	3,096	5,986	183,623	280,644	.....	240,201
1917.	94	5,286	99	136	339,848	48,630	.....	27,646	.....	.....	157,589	496,759	.....	1,557,485
1918.	88	5,073	122	137	276,459	65,535	.....	41,819	B.B.&SH.	15,916	191,068	527,745	.....	1,616,157
1919.	82	4,598	139	104	369,445	73,179	.....	9,077	B.B.&SH.	24,323	175,870	346,639	.....	372,035
1920.	65	4,761	155	45	351,405	95,983	.....	8,441	.....	2,395	101,972	520,856	.....	1,893,156
1921.	56	4,777	59	35	163,914	36,735	.....	6,966	.....	.....	117,288	192,906	.....	84,626
1922.	64	4,491	143	36	299,614	21,163	.....	6,061	7,060	1,220	117,288	192,906	.....	603,548
1923.	61	3,957	223	31	334,647	17,539	.....	11,913	6,431	1,657	102,845	581,979	.....	1,290,326
1924.	62	3,696	242	32	369,601	18,741	.....	4,858	7,037	1,760	112,044	440,932	.....	1,341,677
1925.	65	4,225	329	37	392,643	39,142	.....	2,591	4,267	1,843	115,944	657,561	.....	1,747,505
1926.	76	4,750	445	41	336,995	41,276	.....	4,419	10,675	1,996	188,505	445,400	.....	607,904
1927.	76	5,637	555	46	308,032	34,029	.....	4,177	19,445	2,165	162,449	772,993	.....	1,720,622
1928.	62	5,179	399	22	203,541	11,002	.....	8,819	20,820	1,746	161,148	247,617	.....	701,962
1929.	63	5,609	371	24	281,306	8,295	.....	5,526	6,073	865	150,084	792,362	.....	562,109
							.....	7,926	22,246	672	174,198	477,969	.....	1,360,449
													.....	2,035,637
													.....	1,400,750

*For the years 1878 to 1901 and 1903—particulars of varieties not available—practically all sockeye.
 NOTE.—Licences issued 1923, 1924, 1925, 1926, 1927, 1928 and 1929, include transfers from one district to another.

1911.	3	240	.....	3,434	.....	325	.....	100	7,842	11,467	5,189	65,684
1912.	3	265	.....	5,710	.....	1,226	.....	.....	12,468	12,476	3,245	71,162
1913.	3	265	.....	2,999	.....	152	.....	.....	3,172	20,539	2,987	53,423
1914.	4	265	.....	2,660	.....	725	.....	.....	9,276	25,333	25,569	94,890
1915.	4	265	.....	3,053	.....	648	.....	113	15,171	34,879	11,076	104,289
1916.	4	265	.....	3,061	.....	784	.....	1,498	19,139	59,593	11,200	126,686
1917.	4	265	.....	3,170	.....	1,326	.....	1,125	22,180	44,568	24,938	119,495
1918.	6	265	.....	2,332	.....	1,003	.....	1,789	17,060	59,206	40,368	143,908
1919.	5	300	.....	2,408	.....	581	.....	789	10,900	29,949	24,041	97,512
1920.	5	342	.....	3,584	.....	482	.....	560	3,700	43,151	12,145	81,153
1921.	5	338	.....	1,431	.....	437	.....	413	8,236	29,488	2,176	51,765
1922.	5	304	.....	1,466	.....	341	.....	193	2,533	75,687	11,277	124,071
1923.	5	244	.....	2,522	.....	457	.....	595	7,894	44,165	25,731	99,580
1924.	4	210	.....	2,142	.....	327	.....	1,035	6,362	72,496	26,612	142,939
*1925.	3	210	.....	5,441	.....	387	.....	470	8,188	35,880	23,497	94,752
†1925.	.....	.....	.....	4,067	.....	387	.....	457	7,726	34,530	22,504	89,008
*1926.	4	316	.....	4,616	.....	751	.....	375	4,274	43,891	15,392	85,825
†1926.	.....	.....	.....	4,616	.....	751	.....	375	4,274	50,815	15,392	92,749
*1927.	4	302	.....	3,221	.....	511	.....	96	3,845	16,609	3,307	39,788
†1927.	.....	.....	.....	3,221	.....	511	.....	96	3,845	16,609	3,307	39,788
*1928.	3	263	.....	1,471	.....	68	.....	36	18,002	95,998	4,591	126,339
†1928.	.....	.....	.....	1,471	.....	68	.....	36	10,734	83,183	3,538	104,877
*1929.	3	246	.....	256	.....	57	.....	.....	1,145	10,507	1,261	29,669
†1929.	.....	.....	.....	256	.....	57	.....	.....	1,145	10,342	1,212	29,185

*Pack of fish caught at Naas River regardless where canned. †Pack at Naas River regardless where caught.
 For the years 1881 to 1884, 1888 to 1901 and 1903, particulars of varieties not available—practically all sockeye.
 NOTE.—Licences issued 1926, 1927, 1928 and 1929 include transfers from other districts.

PACK OF CANNED SALMON ON THE SKEENA RIVER—1876 TO 1929

STATEMENT No. 3

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
1876															3,000
1877	1														8,500
1878	2														10,603
1879	2														19,694
1880	2														
1881	2														21,560
1882	2														24,522
1883	5														31,157
1884	5														53,986
1885	2														12,900
1886	3														37,587
1887	5														58,592
1888	5														70,106
1889	6														58,165
1890	7														90,509
1891	7														78,135
1892	8														90,280
1893	7														59,675
1894	7														61,151
1895	7														67,797
1896	8														100,140
1897	8														65,905
1898	6														81,234
1899	7														108,026
1900	10														128,529
1901	11														126,092
1902	10														154,875
1903	10														98,669
1904	11														154,869
1905	12														114,085
1906	14														162,420
							20,621	(Red & Wh. Springs)				10,315	30,529		
							84,717	(Red & Wh. Springs)				7,247	7,523		
							80,394					16,867	38,991 (P.k. & Ch.)		

1907.....	13	.....	.....	.....	.....	.....	10,378	.....	.....	.....	15,247	25,217 (P.k. & Ch.)	*159,255
1908.....	13	.....	.....	.....	.....	.....	13,374	.....	468	.....	10,075	45,404 (P.k. & Ch.)	209,177
1909.....	12	.....	.....	.....	.....	.....	11,727	.....	742	.....	12,249	28,120 (P.k. & Ch.)	140,739
1910.....	12	.....	.....	.....	.....	.....	9,546	.....	239	.....	11,531	13,473	229,035
1911.....	12	850	.....	.....	.....	.....	15,514	.....	2,428	.....	23,376	81,956	254,410
1912.....	12	850	.....	.....	.....	.....	19,332	.....	4,501	.....	39,835	97,588	254,258
1913.....	13	850	.....	.....	.....	.....	23,250	.....	3,186	.....	18,647	66,045	164,055
1914.....	13	850	.....	.....	.....	.....	11,529	.....	211	.....	16,378	71,021	237,634
1915.....	13	962	.....	.....	.....	.....	15,069	.....	204	.....	32,190	107,578	279,161
1916.....	14	868	.....	.....	.....	.....	18,372	.....	2,561	.....	47,409	73,029	223,158
1917.....	15	*788	.....	.....	.....	.....	13,586	.....	2,699	.....	38,456	148,319	292,219
1918.....	15	*889	.....	.....	.....	.....	16,013	.....	6,828	.....	38,759	161,727	374,216
1919.....	14	1,153	.....	.....	.....	.....	19,661	.....	3,624	.....	36,559	117,303	398,877
1920.....	15	954	.....	.....	.....	.....	37,403	.....	2,198	.....	18,068	177,679	334,392
1921.....	13	1,109	.....	.....	.....	.....	18,599	.....	445	.....	45,083	124,457	234,765
1922.....	13	1,091	.....	.....	.....	.....	7,080	.....	5,501	.....	24,673	203,555	362,055
1923.....	13	900	.....	.....	.....	.....	8,863	.....	31,499	.....	31,967	145,973	338,863
1924.....	13	941	.....	.....	.....	.....	144,732	.....	1,361	.....	26,907	181,338	390,967
†1925.....	13	1,067	.....	.....	.....	.....	17,811	.....	1,657	.....	38,029	137,226	76,352
†1925.....	.....	.....	.....	.....	.....	.....	19,185	.....	1,657	.....	39,168	130,083	348,866
†1926.....	15	1,129	.....	.....	.....	.....	17,896	.....	1,750	.....	30,153	170,586	350,804
†1926.....	.....	.....	.....	.....	.....	.....	17,896	.....	966	.....	30,209	210,064	407,533
†1927.....	13	1,195	.....	.....	.....	.....	13,595	.....	3,567	.....	25,209	38,903	177,173
†1927.....	.....	.....	.....	.....	.....	.....	14,556	.....	3,567	.....	25,623	38,761	18,659
†1928.....	11	1,208	.....	.....	.....	.....	4,121	.....	988	.....	18,751	191,812	282,616
†1928.....	.....	.....	.....	.....	.....	.....	5,043	.....	988	.....	30,194	209,579	298,709
†1929.....	11	1,143	.....	.....	.....	.....	3,795	.....	441	.....	37,138	94,846	217,955
†1929.....	.....	.....	.....	.....	.....	.....	3,795	.....	441	.....	37,456	95,308	220,242

* Approximately.

† Pack of fish caught at Skeena River regardless where canned.

† Pack at Skeena River regardless where caught.
For the years 1877 to 1903, particulars of varieties not available—practically all sockeye.

NOTE.—Licences issued 1923, 1924, 1925, 1926, 1927, 1928 and 1929 include transfer from other districts.

[illegible]

NOTE.—Figures shown in black are packs from fish caught at Rivers Inlet or Smiths Inlet. Figures in black for years previous to 1918 are actual packs. Figures shown in italics, 1918 to 1929, are actual packs irrespective of where fish taken, and not including fish shipped out for canning in other districts. Figures in italics, 1930 to 1939, are actual packs of fish shipped out for canning in other districts.

NOTE.—*Re* column "Varieties other than sockeye packed at Smiths Inlet." For the years this column is utilized figures of the different varieties other than sockeye are included in the column "Varieties other than sockeye packed at Smiths Inlet for that year."

NOTE.—Licences issued 1923 1924 1925 1926 1927 1928 and 1929 include transfers from other districts.

* For the years 1882 to 1884 and 1886 to 1901 and 1903—particulars of varieties not available—practically all sockeye.

PACK OF CANNED SALMON IN THE FRASER RIVER DISTRICT—1876 to 1929

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Chums	Totals
		Number of salmon licences issued													
		G.N.	Troll	P.S.	D.S.											T.N.
1876	3														9,847
1877	5														64,387
1878	8														105,101
1879	7														50,490
1880	7														42,155
1881	8														142,516
1882	11														199,104
1883	13														109,701
1884	6														38,437
1885	6														89,617
1886	11														99,177
1887	12														130,088
1888	12														76,616
1889	16														303,875
1890	16														241,889
1891	11														178,954
1892	11														79,715
1893	21														457,797
1894	20														363,967
1895	21														400,368
1896	29														356,984
1897	35														860,459
1898	35														256,101
1899	41														510,383
1900	48														316,522
1901	49	3,832													990,313
1902	42	2,685													327,095
1903	35	3,101													237,125
1904	23	2,224													128,903
							293,477								
							204,809								
							72,698								
							Other Varieties: 33,618								
							2,084 (Red and White Spring)								
							25,728								
							45,667								
							4,504								
							1,066								

1905.....	38	2,770	.....	.....	.....	837,489	5,507 (Red and White Spring)	.....	.....	.....	30,836	3,304	877,136
1906.....	24	1,746	.....	.....	.....	183,007	6,503	.....	.....	.....	34,413	15,543 (Pk. & Ch.)	240,486
1907.....	18	1,726	.....	.....	.....	59,815	3,448	.....	1,020	.....	35,766	63,530 (Pk. & Ch.)	163,116
1908.....	16	1,374	.....	.....	.....	63,126	1,427	.....	557	18	24,198	415 (Pk. & Ch.)	89,184
1909.....	38	2,688	.....	.....	.....	542,248	1,428	.....	.....	.....	21,540	1,987 (Pk. & Ch.)	567,203
1910.....	21	1,577	.....	.....	.....	133,045	1,018	.....	8,925	.....	27,855	128	223,148
1911.....	15	1,396	.....	.....	.....	58,487	7,028	.....	6,751	.....	39,740	142,101	301,344
1912.....	15	1,430	.....	2	.....	108,784	14,655	.....	8,373	.....	38,574	574	173,921
1913.....	35	2,560	.....	.....	.....	684,596	3,573	.....	49	.....	11,648	9,973	732,059
1914.....	20	2,656	.....	2	.....	185,483	9,485	.....	14,000	.....	38,639	6,057	328,390
1915.....	22	2,616	.....	.....	.....	89,040	15,388	.....	9,532	.....	24,114	128,555	289,119
1916.....	21	2,240	.....	.....	.....	27,394	11,096	.....	9,217	3,096	24,580	840	106,440
1917.....	29	2,626	.....	.....	.....	123,614	10,197	.....	18,916	4,944	25,895	134,442	377,988
1918.....	18	1,582	.....	.....	.....	16,549	15,192	.....	24,274	3,760	40,111	18,388	206,003
1919.....	14	1,337	.....	1	.....	29,628	14,519	579	3,592	15,613	39,253	39,363	158,718
1920.....	11	1,288	.....	1	.....	44,598	19,961	704	2,204	4,488	22,934	12,839	132,860
1921.....	13	1,437	.....	8	.....	35,900	11,360	2,188	467	.....	7	59,973	377,988
1922.....	10	1,296	.....	25	.....	48,744	10,561	.....	5,480	1,323	8	8,178	103,917
1923.....	11	964	.....	17	.....	29,423	3,854	2,433	3,867	812	23,587	29,578	137,482
1924.....	9	969	.....	25	.....	36,200	2,982	664	3,615	.....	20,173	63,645	224,637
1925.....	10	969	.....	48	.....	31,523	7,335	592	4,056	1,757	21,935	31,968	209,050
1926.....	10	1,063	.....	50	.....	83,589	11,774	873	25,482	5,107	36,717	99,800	272,993
1927.....	10	1,249	.....	59	.....	57,085	6,553	1,030	20,130	14,036	21,787	32,256	273,134
1928.....	8	1,303	.....	111	.....	26,530	1,173	1,351	10,493	10,631	24,079	102,535	280,013
1929.....	9	1,473	.....	109	.....	60,407	2,984	248	3,661	795	27,061	2,881	255,455
.....	.....	.....	.....	113	.....	.....	.....	912	5,977	11,960	40,540	158,290	425,131

NOTE.—Licences issued 1923, 1924, 1925, 1926, 1927, 1928 and 1929 include transfers from other districts.

*For the years 1876 to 1901, particulars of varieties not available—practically all sockeye.

MARINE AND FISHERIES

STATEMENT No. 6

PACK OF CANNED SALMON OF PUGET SOUND FROM 1887 TO 1929

Year	Number of canneries operated	Spring	Sockeye	Cohoe	Chum	Pink	Steel- head	Total
1887.....		Particulars of varieties not available.						22,000
1888.....	4							21,975
1889.....	2	240		7,480	1,145	2,890		11,674
1890.....	1	1,000		3,000	4,000			8,000
1891.....	2	382	5,538	5,869	3,093	5,647		20,529
1892.....	2	86	2,954	7,206	16,180			26,426
1893.....	3	1,200	47,852	11,812	11,380	17,530		89,331
1894.....	3		41,781	22,418	22,152	9,049		95,400
1895.....	7	1,542	65,143	50,865	38,785	23,633		179,968
1896.....	11	13,495	72,979	82,640	26,550			195,664
1897.....	12	9,500	312,048	91,900	23,310	57,268		494,026
1898.....	18	11,200	252,000	98,600	38,400			400,200
1899.....	19	24,364	499,646	101,387	31,481	252,733		919,611
1900.....	19	22,350	229,800	128,200	89,100			469,450
1901.....		Particulars of varieties not available.						1,380,590
1902.....	21	30,049	372,301	85,817	93,492			581,659
1903.....	22	14,500	167,211	103,450	12,001	181,236		478,488
1904.....	13	14,441	109,264	118,127	49,656			291,488
1905.....	24	1,804	825,453	79,335	41,057	70,992		1,018,641
1906.....	16	8,139	178,748	94,497	149,218			430,602
1907.....	14	1,814	93,122	119,372	50,249	433,423		698,080
1908.....	22	95,210	170,951	128,922	47,607	6,075		448,765
1909.....	11	13,019	1,097,904	143,133	53,688	370,993		1,632,949
1910.....	24	10,064	248,014	162,755	146,942	108		567,883
1911.....	15	21,823	127,761	256,124	104,321	1,046,992		1,557,029
1912.....	20	20,252	184,680	149,727	60,760	700		416,125
1913.....	22	1,234	1,673,099	61,019	56,225	791,886		2,583,463
1914.....	31	26,044	335,230	151,893	278,801	892		792,860
1915.....	41	28,466	64,548	180,783	411,724	583,649		1,269,206
1916.....	32	37,030	84,637	155,832	427,878	1,887		707,278
1917.....	45	57,543	411,538	114,276	216,285	1,124,884		1,921,554
1918.....	32	63,366	50,723	235,860	267,538	6,605		624,198
1919.....	35	68,542	64,346	210,883	525,541	421,215	5,076	1,295,626
1920.....	11	25,846	62,654	24,502	48,849	4,669		166,520
1921.....	23	25,567	102,967	89,412	30,831	404,713		653,490
1922.....	16	20,615	48,566	111,711	65,552	2,225	106	248,729
1923.....	18	15,777	47,402	122,000	97,081	475,849	29	758,138
1924.....	12	19,968	69,369	87,879	134,360	5,945	128	317,649
1925.....	23	28,268	106,064	171,587	41,635	555,848	141	903,543
1926.....	14	27,763	44,569	120,846	112,411	2,125	63	307,778
1927.....	21	43,443	96,343	133,528	37,414	585,506	216	896,450
1928.....	12	24,628	61,044	92,770	145,735	5,816	265	330,258
1929.....	21	32,600½	111,855½	101,363½	150,867	727,748	280½	1,124,715

STATEMENT No. 7

STATEMENT OF HALIBUT LANDINGS—BRITISH COLUMBIA
1913 TO 1929

	cwt.		cwt.
1913.....	223,465	1922.....	293,184
1914.....	214,444	1923.....	334,667
1915.....	194,896	1924.....	331,382
1916.....	123,062	1925.....	318,240
1917.....	113,529	1926.....	315,095
1918.....	186,229	1927.....	271,354
1919.....	210,777	1928.....	302,820
1920.....	238,770	1929.....	304,364
1921.....	325,868		

STATEMENT No. 8

STATEMENT OF DRY SALT HERRING PACKS, 1918-1929—BRITISH COLUMBIA

Year	District No. 1	District No. 2	District No. 3		Total
			East Coast	West Coast	
	cwt.	cwt.	cwt.	cwt.	cwt.
1918.....	20,000	.....	109,900	42,710	172,610
1919.....	4,000	.....	43,000	208,058	255,058
1920.....	807	1	176,640	334,720	512,168
1921.....	249	.....	231,240	248,482	479,971
1922.....	.....	.....	297,871	224,897	522,768
1923.....	.....	8,935	250,420	484,681	744,036
1924.....	.....	.....	305,266	548,277	853,543
1925.....	.....	4,120	591,162	487,892	1,083,174
1926.....	11,134	4,192	596,114	327,207	938,647
1927.....	24,380	7,600	542,385	473,825	1,048,190
1928.....	46,995	.....	748,032	277,161	1,072,188
1929.....	78,800	5,160	691,673	140,751	916,384

STATEMENT No. 9

CANNED PILCHARD PACK—BRITISH COLUMBIA
1917 TO 1929

	Cases		Cases
1917.....	1,090	1924.....	14,898
1918.....	63,693	1925.....	37,182
1919.....	63,065	1926.....	26,731
1920.....	91,929	1927.....	58,501
1921.....	16,091	1928.....	65,097
1922.....	19,186	1929.....	98,821
1923.....	17,195		

STATEMENT No. 10

PRODUCTION FISH OIL AND MEAL—BRITISH COLUMBIA, 1920-1929

Year	From Pilchards		From Herring		From Whales			From Other Sources	
	Meal and Fertilizer	Oil	Meal	Oil	Whale-bone and Meal	Fertilizer	Oil	Meal and fertilizer	Oil
	tons	gals.	tons	gals.	tons	tons	gals.	tons	gals.
1920.....	.....	.....	.....	.....	503	1,035	604,070	466	55,669
1921.....	.....	.....	.....	.....	.....	.....	.....	489	44,700
1922.....	.....	.....	.....	.....	326	230	283,314	911	75,461
1923.....	.....	.....	.....	.....	485	910	706,514	823	180,318
1924.....	.....	.....	.....	.....	292	926	645,657	1,709	241,376
1925.....	2,083	495,653	.....	.....	347	835	556,939	2,468	354,853
1926.....	8,481	1,898,721	310	13,700	340	666	468,206	1,752	217,150
1927.....	12,169	2,673,876	1,838	170,450	345	651	437,967	2,512	375,130
1928.....	14,500	3,995,806	831	68,411	376	754	571,914	3,658	411,207
1929.....	15,826	2,856,579	392	34,924	416	779	712,597	3,671	461,915

STATEMENT No. 11

WHALE CATCH LANDINGS, BRITISH COLUMBIA, 1918 TO 1929

Species	1918	1919	1920	†1921	1922	1923	1924	1925	1926	1927	1928	1929
Sperm.....					38	94	83	76	80	82	83	146
Sulphur.....					4	62	56	29	14	10	47	16
Fin.....					94	166	125	135	124	138	140	168
Hump.....					50	78	47	40	25	21	21	9
Sei.....					1	53	100	68	25	7	13	67
Right.....							2		1			
Bottlenose.....						2	1	3			1	1
Gray.....												
Totals.....	*500	*432	*493		187	455	414	351	269	258	305	407

* All varieties. † No whaling plants operated 1921.

STATEMENT No. 12

STATEMENT OF FUR SEAL SKINS TAKEN AND LANDED, BRITISH COLUMBIA, 1912-1929

Year	District No. 1	District No. 2	District No. 3	Total
1912.....			205	205
1913.....		285	119	404
1914.....		95	257	352
1915.....		39	400	439
1916.....		21	138	159
1917.....		14	204	218
1918.....		78	10	88
1919.....		53	17	70
1920.....		502	556	1,058
1921.....		270	2,079	2,349
1922.....		291	639	930
1923.....		678	3,746	4,424
1924.....		370	1,862	2,232
1925.....		810	3,655	4,465
1926.....		655	2,169	2,824
1927.....		188	1,288	1,476
1928.....		465	1,625	2,090
1929.....		1,119	2,264	3,383

STATEMENT No. 13

DESTRUCTION OF SEA LIONS 1922-1929

—	1922	1923	1924	1925	1926	1927	1928	1929	Total
Virgin rocks—									
Pups.....		649	903	1,067	565	635	375	522	4,716
Adults.....		1,111	1,333	1,520	877	858	632	695	7,026
Pearl rocks—									
Pups.....		5	312	102	146	40	2	7	614
Adults.....	220	120	158	138	368	130	30	119	1,283
Solander rocks—									
Adults.....							103	16	119
Totals.....	220	1,885	2,706	2,827	1,956	1,663	1,142	1,359	13,758

STATEMENT No. 15

STATEMENT OF SALMON LICENCES ISSUED, BRITISH COLUMBIA, 1919-1929

Kind of Licence	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
<i>District No. 1—</i>											
Salmon cannery.....	14	11	13	10	11	9	10	10	10	10	9
Salmon gill-net.....	1,337	1,288	1,437	1,296	964	969	969	1,063	1,249	1,303	1,473
<i>District No. 2—</i>											
Salmon cannery.....	45	41	32	41	37	38	41	50	48	47	45
Salmon purse-seine.....	35	79	13	73	126	107	137	193	244	158	153
Salmon drag-seine.....	81	38	30	30	20	19	15	14	16	9	9
Salmon gill-net:—											
Naas River.....	300	342	338	304	244	210	210	316	302	263	246
Skeena River.....	1,153	1,153	1,109	1,091	900	941	1,068	1,129	1,193	1,208	1,143
Rivers Inlet.....		871	1,000	1,012	987	770	891	1,115	1,273	1,117	1,149
Smiths Inlet.....	916	173	215	179	193	236	368	570	424	428	
Bella Coola.....		193	241	165	134	146	139	192	195	173	236
Kimsquit.....				120	122	96	137	100	104	80	194
Butedale.....		61	5		63	32	60	37	108	58	56
Namu.....	421	136	138	136	215	87	109	139	180	77	116
Queen Charlotte Ids.		14	1	4	1	1	17	27	42	22	3
Total, District No. 2..	2,490	2,943	3,047	3,011	2,863	2,476	2,867	3,423	3,972	3,422	3,571
<i>District No. 3—</i>											
Salmon cannery.....	23	13	11	14	13	15	16	19	18	19	17
Salmon purse-seine.....	103	76	46	74	97	135	192	252	308	239	218
Salmon drag-seine.....	23	7	5	10	11	13	22	27	30	13	13
Salmon gill-net.....	771	530	293	176	142	251	390	364	422	454	565
<i>Whole Province—</i>											
Salmon cannery.....	82	65	56	65	61	62	67	79	76	76	71
Salmon purse-seine.....	138	155	59	147	223	242	329	445	552	397	371
Salmon drag-seine.....	104	45	35	40	31	32	37	41	46	22	22
Salmon gill-net.....	4,598	4,761	4,777	4,483	3,969	3,696	4,226	4,850	5,643	5,179	5,609

NOTE.—During the season 1928 F. Millerd's cannery at Vancouver, the Cassiar Cannery on the Skeena and the Massett Cannery, Masset Inlet, operated without licences, and are not included in the number of cannery licences shown above.

NOTE.—During season 1929, 2 canneries in District No. 1, 4 in District No. 2 and 2 in District No. 3 operated without licences and are not included in number above.

STATEMENT No. 16

STATEMENT OF POWER BOATS OPERATED IN DISTRICT No. 2, BRITISH COLUMBIA, IN CONNECTION WITH SALMON GILLNET OPERATIONS

	1924	1925	1926	1927	1928	1929
Naas river.....	3	9	35	21	37	34
Skeena river.....	18	64	133	162	216	263
Bella Coola and Kimsquit.....	1	12	49	47	90	70
Central area.....		8	28	87	13	73
Rivers inlet.....	54	110	254	248	479	435
Smiths inlet.....	9	39	131	110	204	135
Queen Charlotte islands.....					10	Nil
	85	242	630	675	1,049	1,010

STATEMENT No. 17

AIR PATROL SERVICE—1929

From undermentioned bases	Hours	Minutes
Vancouver.....	3	20
Swanson Bay.....	214	20
Queen Charlotte.....	100	18
Rivers Inlet.....	6	10
Alert Bay.....	66	25
Stillwater.....	9	15
Quathiaski.....	8	20
Totals.....	408	08
Total for 1928.....	261	30
Total for 1927.....	92	02

STATEMENT No. 18

BOUNTY PAID BY DEPARTMENT ON HAIR SEALS AND SEA LIONS

Fiscal year	Hair seals			Sea lions		
	Rate	Number	Amount	Rate	Number	Amount
	\$ cts.		\$ cts.	\$ cts.		\$ cts.
1914-15.....	3 50	2,237	7,829 50			
1915-16.....	1 00	749	749 00	2 00	2,875	5,750 00
1916-17.....	1 00	785	785 00			
1917-18.....	1 00	748	748 00			
1927-28.....	3 50	567	1,984 50			
1928-29.....	3 50	3,209	11,231 50			
1929-30 (to Dec. 31/29).....	2 50	5,367	13,417 50			
Totals.....		13,662	36,745 00		2,875	5,750 00

STATEMENT No. 19

SALMON TAKEN BY INDIANS FROM ABOVE THE COMMERCIAL FISHING BOUNDARY
ON THE FRASER RIVER WATER-SHED, 1929

Area	Sock-eye	Springs	Cohoos	Pink	Chums	Number fish actually cured	Estimated used fresh not included in number reported	Totals
Stuart Lake.....	7,539					7,359	2,513	10,052
Francois Lake.....	516	249				765	255	1,020
Quesnel area.....	6,861	157				7,017	2,399	9,357
Shuswap area.....		450	500			950	316	1,266
Bridge River area.....	6,214	675	17			6,906	2,302	9,208
Kamloops area*.....	18,012	7,850	4,130			29,992	9,997	39,989
Hope area.....	2,670	2,695	730	985	170	7,258	2,419	9,677
Birkenhead River system.....		1,000	5,000			6,000	2,000	8,000
Harrison Lake system.....	1,450	1,500	2,400	1,200	2,500	9,050	3,016	12,066
Fraser River below Mission....	4	335	44	87	42	512	171	683
Cultus Lake system.....	735	240	1,450	1,075	2,250	5,750	1,917	7,667
Reported cured—total.....	44,001	15,151	14,279	3,347	4,962	81,740	27,245	108,985
Used fresh—not reported.....	14,667	5,050	4,759	1,115	1,654		27,245	
Totals.....	58,668	20,201	19,038	4,462	6,616			108,985
Estimated further take to December 31.....			6,200					6,200
Grand totals.....	58,668	20,201	25,238	4,462	6,616			115,185

*Returns for Kamloops include 11,000 spawned sockeye from fish cultural operations.

STATEMENT No. 20

SALMON TAKEN BY INDIANS FROM ABOVE COMMERCIAL FISHING BOUNDARIES,
DISTRICT No. 2, 1929

Point	Indian families	Sockeye	Springs	Cohoos	Pinks	Chums	Steel-head	Total
<i>Skeena River—</i>								
Babine Lake area.....	92	114,857	2,000	400	18,750			136,007
Lower Skeena and tributaries.	310	45,000	1,500	25,000	8,000	3,000	1,000	83,500
Totals for Skeena system....	402	159,857	3,500	25,400	26,750	3,000	1,000	219,507
Naas area.....	80	16,000	3,000	15,000		1,000		35,000
Rivers Inlet and Owekano Lake.	18	3,600		5,000				8,600
Smiths Inlet.....	(No Indians have fished this area for a number of years)							
Central Division.....	5	1,000 (Creek sock-eye)		500		2,000		3,500
Queen Charlotte Islands.....	44	10,000 (Creek sock-eye)		2,500		9,000		21,500
Bella Coola.....	10	5,000		2,000				7,000
Totals.....	559	195,457	6,500	60,400	26,750	15,000	1,000	286,107

STATEMENT No. 21

STATEMENT OF NUMBERS OF DIFFERENT SPECIES OF SALMON AND METHOD OF CAPTURE,
REPORTED BY OPERATORS OF SALMON PURSE-SEINES, DRAG-SEINES, AND TRAP NETS AND
BY SALMON CANNING, CURING AND COLD STORAGE ESTABLISHMENTS, OF GILL-NET AND
TROLL CAUGHT FISH, BRITISH COLUMBIA, 1920-1929.

—	Sockeye	Springs	Bluebacks	Steelheads	Cohoos	Pinks	Chums	Total
1920								
Troll.....		199,492	72,933	2,581	312,943			587,949
Gill-net.....	3,751,724	398,172	562	40,831	537,925	4,842,490	416,348	9,988,061
Purse-seines.....	153,380	4,666	753	80	84,383	4,633,505	524,998	5,401,765
Drag-seines.....	321,894	1,849	1		9,220	347,135	10,281	690,380
Trap-nets.....	54,074	37,578	35,829	931	68,318	381,006	29,528	607,264
Totals.....	4,281,072	641,757	110,078	44,423	1,012,789	10,204,145	981,155	17,275,419
1921								
Troll.....		104,743	81,962	58	248,290			435,053
Gill-net.....	1,863,941	267,355	16,047	37,659	743,882	3,238,196	373,758	6,540,838
Purse-seines.....	74,578	7,730	230	20	53,224	370,881	830,193	1,336,856
Drag-seines.....	175,793	11			8,654	124,344	85,577	394,379
Trap-nets.....	46,016	26,926	176	874	77,658	100,618	2,301	254,569
Totals.....	2,160,328	406,765	98,415	38,611	1,131,708	3,834,039	1,291,829	8,961,695
1922								
Troll.....		99,621	103,883	27	235,499			439,030
Gill-net.....	3,361,516	235,493	3,397	26,412	687,780	5,124,904	673,921	10,113,423
Purse-seines.....	250,238	2,948	1,220	25	206,094	5,445,975	2,498,036	8,404,536
Drag-seines.....	310,946	9			16,850	139,561	5,159	472,525
Trap-nets.....	36,534	35,157	517	1,204	137,345	5,300	3,130	219,187
Totals.....	3,959,234	373,228	109,017	27,668	1,283,568	10,715,740	3,180,246	19,648,701
1923								
Troll.....		42,037	115,850	5	188,341			346,233
Gill-net.....	4,004,378	273,813		41,305	530,198	4,098,494	858,433	9,806,621
Purse-seines.....	248,003	2,175	3,342	16	223,599	3,484,315	4,000,504	7,961,954
Drag-seines.....	183,594				9,294	150,071	5,977	348,936
Trap-nets.....	37,961	24,965		1,650	176,207	184,126	42,604	467,513
Totals.....	4,473,936	342,990	119,192	42,976	1,127,639	7,917,006	4,907,518	18,931,257

FISHERIES BRANCH

131

STATEMENT No. 21—Concluded

STATEMENT OF NUMBERS OF DIFFERENT SPECIES OF SALMON AND METHOD OF CAPTURE,
REPORTED BY OPERATORS OF SALMON PURSE-SEINES, DRAG-SEINES, AND TRAP NETS
AND BY SALMON CANNING, CURING AND COLD STORAGE ESTABLISHMENTS, OF GILL-
NET AND TROLL CAUGHT FISH, BRITISH COLUMBIA, 1920-29—Concluded

—	Sockeye	Springs	Bluebacks	Steelheads	Cohoos	Pinks	Chums	Total
1924								
Troll.....		59,265	73,086	90	151,376			283,817
Gill-net.....	4,252,829	228,924		62,680	515,726	3,583,335	1,587,538	10,231,032
Purse-seines.....	405,798	2,530		1,251	172,041	8,137,898	4,773,994	13,493,512
Drag-seines.....	268,483	2,132			15,233	14,451	11,187	311,476
Trap-nets.....	56,123	13,005		1,649	149,220	18,711	15,103	253,811
Totals.....	4,983,233	305,846	73,086	65,670	1,003,596	11,754,395	6,387,822	24,573,648
1925								
Troll.....		132,136	179,160	313	318,852			630,461
Gill-net.....	4,307,852	498,032		31,571	874,972	3,531,290	1,397,519	10,641,236
Purse-seines.....	452,766	6,851		1,618	426,220	3,706,668	5,255,623	9,849,746
Drag-seines.....	165,023	3,250		1	6,804	16,369	8,172	196,369
Trap-nets.....	63,875	29,529	629	874	142,488	379,331	53,440	670,166
Totals.....	4,989,516	666,548	179,789	34,377	1,769,336	7,633,658	6,714,754	21,987,978
1926								
Troll.....		135,246	328,076	859	397,064			861,275
Gill-net.....	3,634,337	320,962	13	79,179	482,579	2,803,151	1,111,695	8,431,916
Purse-seines.....	403,047	4,357	3,909	248	464,211	10,770,891	6,129,410	17,776,073
Drag-seines.....	156,959	3,250			5,825	6,530	1,369	173,933
Trap-nets.....	38,080	26,105	3,864	399	94,588	23,353	40,961	227,350
Totals.....	4,232,423	489,920	335,862	80,685	1,444,297	13,603,925	7,283,435	27,470,547
1927								
Troll.....		294,325	341,999	1,902	430,601	5,684	4,113	1,078,624
Gill-net.....	3,562,885	275,158		77,311	520,229	2,392,434	516,604	7,344,621
Purse-seines.....	391,222	14,654	21,479	1,051	339,766	1,515,984	4,817,537	7,101,693
Drag-seines.....	67,220	1		3	1,490	212	6	68,933
Trap-nets.....	50,781	30,148	602	1,268	91,469	240,281	8,492	423,041
Totals.....	4,072,108	614,287	364,080	81,535	1,383,555	4,154,595	5,346,752	16,016,912
1928								
Troll.....		175,441	90,568	1,161	467,113	1,073	1,500	736,856
Gill-net.....	2,085,827	197,991	143	64,772	692,071	4,732,684	906,803	8,680,291
Purse-seines.....	285,336	7,500	13,453	574	244,509	9,562,787	6,754,109	16,838,268
Drag-seines.....	74,338	3			8,963	34,136	5,694	123,134
Trap-nets.....	31,933	34,033	412	1,518	61,725	2,928	6,917	139,466
Totals.....	2,447,434	414,968	104,576	68,025	1,474,381	14,333,608	7,675,023	26,518,015
1929								
Troll.....		148,469	372,200	3,272	352,593	28,945	68,353	973,832
Gill-net.....	3,254,789	161,366	1,019	72,626	651,559	4,146,640	638,816	8,926,815
Purse-seines.....	240,043	10,473	12,354	512	341,240	3,182,019	3,212,573	6,999,214
Drag-seines.....	65,433	1,903			5,820	7,965	393	81,514
Trap-nets.....	44,201	22,543	260	1,364	45,166	185,961	8,330	357,825
Totals.....	3,604,466	344,754	385,833	77,774	1,446,378	7,551,530	3,928,465	17,339,200

APPENDIX No. 2

REPORT OF THE WORK OF THE BIOLOGICAL BOARD OF CANADA
FOR 1929-30

The Biological Board, which operates under the control of the minister and acts as the Scientific Division of the Fisheries Department, was created in 1912 by an Act of Parliament. For ten years the membership of the board consisted entirely of scientists, and two stations for purely scientific and fundamental research were operated for a few months yearly.

In 1923 the Act was amended with a view to bringing the board into closer contact with the department and the practical problems of the fishing industry. Under the amended Act the board now consists partly of scientific men, partly of departmental officers, and partly of men from the industry.

With this new organization, the board now employs a permanent staff of scientists and operates five research stations. Three stations are principally concerned with the more purely scientific and fundamental problems, while the other two, which are known as Fisheries Experimental Stations, deal with problems arising in connection with the handling and preservation of fish.

Three of the stations are located on the Atlantic coast; the Biological Station at St. Andrews, N.B., the Eastern Passage Laboratory at the entrance to Halifax harbour, and the Atlantic Fisheries Experimental Station at Halifax, N.S.

Two are on the Pacific coast; the Pacific Biological Station at Nanaimo, B.C., and the Pacific Fisheries Experimental Station at Prince Rupert, B.C.

In addition, a field station for the investigation of the sockeye salmon is maintained at Cultus lake, B.C., and by courtesy of the University of Manitoba laboratory facilities are provided for carrying on investigations of the fisheries of the prairie lakes.

The board during the year 1929-30 was composed of the following:—

- Prof. J. P. McMurrich, Toronto, Chairman.
- J. J. Cowie, Ottawa, Secretary-Treasurer.
- Prof. Philip Cox, Fredericton, N.B.
- Prof. A. T. Cameron, Winnipeg, Man.
- Prof. C. J. Connolly, Antigonish, N.S.
- John Dybhavn, Prince Rupert, B.C.
- Prof. J. N. Gowanloch, Halifax, N.S.
- Prof. A. H. Hutchinson, Vancouver, B.C.
- Prof. W. T. MacClement, Kingston, Ont.
- Prof. Marie-Victorin, Montreal, P.Q.
- Prof. H. G. Perry, Wolfville, N.S.
- Prof. E. E. Prince, Ottawa, Ont.
- Prof. W. P. Thompson, Saskatoon, Sask.
- Dr. R. C. Wallace, Edmonton, Alta.
- A. Handfield Whitman, Halifax, N.S.
- Prof. A. Willey, Montreal, P.Q.
- Prof. Alexandre Vachon, Quebec.
- J. A. Rodd, Ottawa, Ont.

THE ATLANTIC BIOLOGICAL STATION, ST. ANDREWS, N.B.

STAFF

Dr. A. G. Huntsman, Director.
Mr. H. B. Hachey, Assistant Hydrographer.
Dr. R. H. M'Gonigle, Assistant Pathologist.
Mr. A. W. Needler, Scientific Assistant in Marine Biology.
Mr. R. A. McKenzie, Scientific Assistant in Limnobiology.
Mr. H. C. White, Scientific Assistant in Aquiculture.
Mr. M. W. Smith, Scientific Assistant in Limnobiology.
Miss M. S. Rigby, Secretary.
Mr. E. G. Rigby, Curator.
Mr. C. A. Young, Assistant to Curator.
Mr. A. E. Calder, Master of Boat and Collector.

The Atlantic Biological Station is situated in the midst of the most concentrated shore fisheries of the Atlantic coast (and perhaps of the world), since no other similar stretch of that coast has anything like as great fisheries in either poundage or value as have the waters of Charlotte county, New Brunswick.

IMPROVED FACILITIES

During the year facilities for carrying on investigations at the Station have been bettered in a number of respects. For the first time accommodation has been provided for workers with families, who would not otherwise leave their homes to undertake work during prolonged periods. For these a double cottage with housekeeping arrangements has been erected. A large open tidal pool has been constructed on the foreshore in front of the laboratory to improve the salt water supply to the laboratory and for experimental purposes. A small cove, which drains at low tide, situated at the head of Passamaquoddy Bay, has been dammed off to permit of the construction at reasonable cost of a series of enclosed tidal pools, in which can be studied the effects of varying tidal interchange and fresh-water inflow, which determine the suitability of inlets for oysters and other important forms living in estuaries.

A small building, formerly used for pumping and power equipment has been enlarged and remodeled to make a two-storey- thirty-six feet by forty feet Fish Handling building. In this has been installed refrigerating equipment of new design, based upon the principles developed in the board's investigations of freezing and storage. An automatic, electrically driven, self-contained ammonia unit with a capacity of seven tons of refrigeration per day operates a trapped and jacketed cold storage space. Built in the jacket is a brine tank available for freezing at any time any quantity of fish per day up to the limit of the capacity of ammonia unit.

EXPERIMENTAL SALE OF ICE FILLETS

During the year for the experiment in the Toronto market a fairly steady, but limited, supply of the new ice fillets has been put up with the simple, primitive equipment, which alone has hitherto been available—hand machines for making the cakes, small ice and salt tanks for freezing, and a small, antiquated experimental freezer for storage. An automatic machine for making the cakes has been developed and is now ready for final testing. An automatic freezer has been in process of development. Ice fillets of the following varieties have been put up for experimental trial—haddock, cod, pollock, hake, gray flounder, Canadian plaice, witch, and salmon. Small herring have been put up in cakes similar to the ice fillets, and sold as breakfast herring, in an effort to put the "sardines" on the lucrative fresh fish market. The sale of ice fillets in the Toronto market, although successful from the start in January, 1929, is still being carefully followed as a most important sales experi-

ment. Over fifty tons have been sold at standard high prices through the very few channels properly equipped to handle the product. On request an effort has been made to ensure the maintenance of a high quality through supervising inspection. Rapid expansion of the sales has been held back (1) by lack of a full and steady supply of the most desired varieties, (2) by the virtual absence of advertising, which the firms concerned could profitably undertake only when able to distribute to the ultimate consumer widely and regularly, and (3) by the inadequacy of the present commercial methods and equipment for properly storing and distributing frozen fishery products. The mere demonstration of the character and extent of this inadequacy, apart from the introduction of a new product and the general stimulus to the fish trade, has made the experiment very well worth while.

BIOLOGICAL SURVEYS

Perhaps the first function of the Stations is the making of a biological survey of the waters. In this field Prof. P. M. Bayne, of Acadia University, has been studying and comparing the life of the various parts of the Bay of Fundy and in 1929 examined into the conditions at the mouth of that bay on the Nova Scotian side, incidentally reporting upon the bait situation in St. Mary bay. Miss V. M. Davidson, of the Toronto High School of Commerce, has now been able to demonstrate from studies lasting for some years that the amount of light from the sun, low at the winter solstice and high at the summer solstice, is almost the only thing to set a limit to the production of vegetable plankton (the primary food for fishes) in Passamaquoddy bay and the adjacent part of the bay of Fundy, so fundamentally rich are these waters. Mr. C. L. Newcombe, a former graduate of Acadia University, has made a quantitative survey of the various kinds of life produced at different levels and on different kinds of bottom as exposed at low tide in the extensive foreshore of the district. A hydrographical and biological survey was made of the waters in the vicinity of Churchill, Manitoba, by Mr. F. Johansen in connection with the general program for studying conditions in Hudson bay and Strait.

WATER CLIMATE

Surveys of the water climate or hydrography of the coast form also an important function of the Station. The hydrographer, Mr. H. B. Hachey, has installed thermographs (for the continuous record of water temperatures) on two vessels of the Canadian National Steamships line from Halifax to Bermuda, and the West Indies, has established six stations for the regular recording of temperatures and weather observations at light houses and light ships from Grand Manan at the mouth of the bay of Fundy to Scatari island, Cape Breton, and has studied the source and distribution of the cold rich water at the mouth of Passamaquoddy bay and the tides of the latter in connection with the project to dam it for power purposes. Mr. J. M. Morton, the Assistant for Technical Processes, tested the sea water for the fertilizing phosphates, finding them abundant where the deep water was being brought to the surface and also in the shallow water at the heads of estuaries. Dr. R. H. McGonigle, Pathologist, found that the purity of the water of the region, as judged by tests for sulphuretted hydrogen, is uniformly quite high, and that there is no indication that industrial plants affect the purity to any appreciable degree, owing to the strong tidal action. Professor A. B. Klugh, of Queen's University, was able to measure the amount of important ultraviolet light coming from the sun, and Mr. R. Sawyer, of McGill University, made determinations of the extent to which various rays of the sun's light can penetrate the sea water to bring about the growth of vegetable matter or to act injuriously on various forms of life.

LIFE-HISTORIES OF FISHES

Attention has been given to individual fishes in studies of their life-histories (migrations, spawning habits, growth, etc.) Mr. A. W. H. Needler, of the University of Toronto, has nearly completed his investigations of the haddock, in which he has been able to demonstrate the occurrence of three geographical stocks or races differing in their distribution, growth characters, and habits. Mr. G. W. Jeffers, of State Teachers College, Farmville, Virginia, has studied the capelin and the cod as they occur together in the strait of Belle Isle. Mr. R. B. Kerr, of the University of Toronto, has begun work on the growth of the Canadian Atlantic salmon, in particular those of the St. John and Miramichi rivers. Miss H. Cameron and Miss H. Reid, of the University of New Brunswick, have been studying the distribution and growth of the white perch and sunfish, respectively.

LIMITING FACTORS

A number of investigators have been busied with experiments to determine the significance of certain physical conditions for aquatic life. Dr. K. E. Carpenter undertook an analysis of the water supply of the Station to determine whether metals from the pipes were responsible for the death of trout and salmon fry. Dr. M'Gonigle has begun a general investigation of the factors that give trouble in attempts to rear fish in confinement for cultural purposes. Professor Klugh determined the effect of ultraviolet light from the sun on various marine forms, and also the ability of a number of kinds of sea plants to make use of the various rays in the sun's light for their growth, which determines at what depths they can live below the surface of the water. Mr. M. H. Friedman, of McGill University, tested the ability of species of shrimp from different levels to withstand freezing temperatures.

DISEASES OF FISH

The diseases of fish were given attention, Dr. M'Gonigle taking up the matter of a disease that has appeared among the salmon of Canada for the first time (so far as known) and from the St. Lawrence to the St. John. Miss A. Alley, of the University of Toronto, investigated a disease in the herring of the bay of Fundy, that threatened to develop to serious proportions.

PHYSIOLOGY AND ANATOMY OF FISH

Professor A. D. Ritchie, of Manchester University, studied the physiology of the muscular system of the giant scallop, and Prof. B. Babkin, of McGill University, and Dr. G. S. Eadie, of Johns Hopkins University, the physiology of the digestive system of various fishes. Miss B. MacDonald, of Dalhousie University, undertook a study of the structure and development of the muscle in fishes, this being the principal part that is used as food.

DECOMPOSITION OF FISH

Miss A. Bennie, of Queen's University, isolated forty-six cultures of bacteria from the skin and gut of the haddock in order to determine their ability to grow at low temperatures such as occur in iced fish. Many of them were found to grow well at such low temperatures and should, therefore, be kept from infecting the fish. Mr. N. E. Gibbons, of Queen's University, investigated the effects of such bacteria in decomposing the flesh of the haddock. Mr. Morton investigated the effectiveness of disinfecting the surface of gutted and ungutted fish with various strengths of formaldehyde and chlorine solutions, some of which were found to definitely delay decomposition although not allowed to act long enough to reach the flesh of the fish.

COOKING OF FISH

Miss D. Dow, of the University of Toronto, tested a large number of recipes for the cooking of Ice Fillets and was able to recommend the majority of these as satisfactory. She also investigated the effect of the heat of cooking on the consistency of the flesh of the haddock, finding that for a time at lower temperatures the flesh actually becomes firmer, though at high temperatures it softens rapidly.

FOOD VALUE OF MARINE PRODUCTS

Miss M. R. Butler began a study of the chemical composition of a number of kinds of algae with a view to determining their suitability for human food, particular attention being directed to iodine and carbo-hydrate content.

FISH CULTURE

Mr. H. C. White, aquiculturist, made a survey of the various sources of water in the district, principally from springs with regard to their suitability for an experimental hatchery. He also followed up conditions in the Chamecook lake system, including the hydrography and plankton of several of the lakes, the fate of planted salmon fry, and the migrations of young eels up from, and old eels down to the sea. A study of the food of young trout, salmon and sticklebacks in the waters of Prince Edward Island has been continued. Mr. M. W. Smith, Limnobiologist, has studied in detail the physical and biological conditions in experimental stagnant ponds with and without fertilizers, with a view to their use in rearing fish fry. Mr. A. W. H. Needler, Marine Biologist, began an investigation of the oyster fisheries of Prince Edward Island with the object of developing rational cultural practice. A survey was first made to determine the most suitable place for the principal experiments and the Bideford river was selected. Wire baskets containing clean mussel and oyster shells were distributed systematically to determine the localities and depths for the principal set of the oyster spat. Experimental beds were cleaned and planted with spat and with large oysters, and investigations were made of the hydrography of Bideford river, of the possibility of restocking Savage harbour, of the distribution of oysters of various sizes, and of the reported occurrence of disease in a bed of oysters.

THE FISHERIES OF INLAND WATERS

In Ontario Mr. E. S. Pentland began in November a study of certain freshwater shrimps (*Gammarus*) with the object of developing means for their culture as fish food. Fifteen localities were examined as to the presence and abundance of the kinds and as to the physical conditions. Experimental work is proceeding in the laboratories of the University of Toronto.

Dr. D. S. Rawson, of the University of Saskatchewan, has organized a survey of the principal lakes and streams in the Prince Albert National Park with a view to the conservation and improvement of the fisheries there.

Mr. A. Bajkov has completed an extensive study of the whitefish of the Manitoban lakes. He estimates that the whitefish population of these lakes has remained fairly constant, that of lake Winnipeg at about 6,000,000 individuals, that of lake Winnipegosis at 2,000,000 and that of lake Manitoba at about 500,000. A quantitative estimate of the food supply available indicates that the lakes are capable of supporting a very much greater population of these fish, but the mortality of the eggs spawned under natural conditions is exceedingly high. It is concluded that the productivity of the lakes can be considerably increased by artificial fish culture, provided the fry are cared for over a period of at least one month, the highest mortality being apparently just subsequent to hatching. The available evidence seems to indicate that no considerable migration of whitefish takes place from one of these lakes to another.

Observations have also been made on the food, rate of growth, spawning, etc., of the pickerel in these lakes, the results of which will be presented in a later report. An examination of a number of pickerel was made to determine the frequency of occurrence in them of the immature shape of a tape-worm known to infect human beings. In 300 fish from lake Winnipeg infection was found in 1 per cent, but in fish from lake Manitoba the infection was somewhat higher. The number of fish examined from the latter lake was, however, too few for definite results. It is hoped that investigations now being carried on at the University of Manitoba and elsewhere will result in a knowledge of the complete life-history of the parasite and will give an indication of means that may be taken to counteract the infection.

In connection with the planting of whitefish and cisco in the alkaline Quill lakes of Saskatchewan a small experimental hatchery was set up and eggs of both species were fertilized in the alkaline water. About 90 per cent of the eggs hatched out vigorous and normal fry, and the experiment indicates that both these species may complete their life-histories in the Quill lakes.

PAPERS PUBLISHED DURING 1929

The following papers on work done in connection with the Station have been published:—

- Battle, H. I.—A note on lethal temperature in connection with skate reflexes. *Contr. Canad. Biology and Fisheries*, N.S., Vol. IV, No. 31.
- Battle, H. I.—Temperature coefficients for the rate of death of the muscle in *Raja erinacea* (Mitchill) at high temperatures. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 32.
- Effects of extreme temperatures and salinities on the development of *Enchelyopus cimbrius* (L.), *Contr. Canad. Biol. and Fish.* N.S., Vol. V, No. 6.
- Berrill, N. J.—The validity of *Lophius americanus* Val. as a species distinct from *L. piscatorius* Linn., with notes on the rate of development. *Contr. Canad. Biol. and Fish.* N.S. Vol. IV, No. 12.
- Digestion in ascidians and the influence of temperature. *Brit. Journ. Exper. Biol.*, Vol. VI, No. 3.
- Burwash, Frances M.—The iodine content of the thyroid of two species of Elasmobranchs and one species of Teleost. *Contr. Can. Biol. and Fish.*, N.S., Vol. IV, No. 9.
- Connolly, C. J.—A new copepod parasite *Choniospiera cancrorum*, gen. it. sp.n., representing a new genus, and its larval development. *Proc. Zool. Soc. Lond.* 1929.
- Coulthard, H. S.—Growth of the sea mussel. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 10.
- Duff, G. L.—Factors involved in the production of annual zones in the scales of the cod (*Gadus callarias* Linnaeus) *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 21.
- Harvey, J. M.—The action of light on *Calanus finmarchicus* (Gunner) as determined by its effect on the heart rate. *Contr. Canad. Biol. and Fish.*, N.S., Vol. V, No. 4.
- Hayes, F. R.—Contributions to the study of marine Gastropods. III. Development, growth, and behaviour of *Littorina*. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 26.
- Henderson, J. T.—Lethal temperatures of Lamellibranchiata. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 25.
- Huntsman, A. G.—Frozen fish the freshest. *Institute Bull.* May, 1929.
- Koch, L. W.—Notes on Canadian Rotifera, *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 5.
- Klugh, A. B.—The effect of the ultra-violet component of sunlight on certain marine organisms. *Can. Journ. of Res.*, Vol. I, No. 1.
- McKay, M. E.—The digestive system of the eel pout (*Zoarces anguillaris*). *Biol. Bull.* Vol. LVI, No. 1.
- Note on the bile in different fishes. *Biol. Bull.* Vol. LVI, No. 1.
- Needler, A. W. H.—Studies on the life history of the haddock (*Melanogrammus aeglefinus* Linnaeus). *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 20.
- Rankin, G. P.—The nutritional physiology of Cladocera. *Contr. Canad. Biol. and Fish.*, N.S. No. 8.
- Reed, Guildford B., Rice, Christine E., & Sinclair, R. G.—A comparative study of autolysis and bacterial decomposition in haddock, lobster and clam muscle. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 18.
- Reed, Guildford B., and Spence, C. Marion.—The intestinal and slime flora of the haddock. A preliminary report. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 19.

- Reid, M. E.—The distribution and development of the Cunner (*Tautogolabrus adspersus* Walbaum) along the eastern coast of Canada. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 27.
- Rice, C. E.—The decomposition of clam muscle in acid solutions. *Contr. Canad. Biol. and Fish.*, N.S., No. 7.
- Scott, W. C. M.—A note on the effect of temperature and salinity on the hatching of the eggs of the winter flounder (*Pseudo-pleuronectes americanus* Walbaum) *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 11.
- Sparks, M. E.—The spawning and development of mackerel on the outer coast of Nova Scotia. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 28.
- Willey, Arthur—Notes on the distribution of free-living Copepods in Canadian waters. Part II. Some intertidal Harpacticoids from St. Andrews, New Brunswick, *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 33.
- Wilton, M. H. and H. I. Wilton—Conditions affecting the growth of the softshell clam, *Mya arenaria* L. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 6.
- The following is a list of papers published in connection with work on inland lakes:—
- Bajkov, Alexander—Reports of the Jasper Park lakes investigations, 1925-26, VII. A study of the plankton. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 24.
- Bere, Ruby—Reports of the Jasper Park lakes investigations, 1925-26. III. The leeches. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 14.
- Neave, Ferris—Reports of the Jasper Park lakes investigations, 1925-26. II. Plecoptera, *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 13.
- IV. Aquatic insects. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 15.
- Neave, F and A. Bajkov—Reports of the Jasper Park lakes investigations, 1925-26, V. Food and growth of Jasper Park fishes. *Contr. Canad. Biol. and Fish.* N.S., Vol. IV, No. 16.
- Wallis, J. B.—Reports of the Jasper Park lakes investigations, 1925-26, VI. The beetles. *Contr. Canad. Biol. and Fish.*, N.S., Vol. IV, No. 17.

FISHERIES EXPERIMENTAL STATION (ATLANTIC), HALIFAX, N.S.

STAFF

The following constituted the staff of the Station during the year 1929-30:—

- Dr. A. H. Leim, Director.
- Dr. J. R. Sandborn, Chief Bacteriologist (from May 13, 1929).
- Mr. Ernest Hess, Assistant Bacteriologist (on leave of absence from Sept. 5, 1929).
- Dr. J. H. Mennie, Chief Chemist (from July 3, 1929).
- Dr. H. R. Chipman, Scientific Assistant in Chemistry.
- Mr. S. A. Beatty, Associate Biochemist (from May 10, 1929).
- Miss A. M. Wilson, Technical Assistant in Chemistry.
- Mr. F. Watson, Fishery Demonstrator (resigned June 1, 1929).
- Mr. E. F. Mitchell, Mechanician (resigned July 31, 1929).
- Mr. M. J. Murphy, Mechanician from Aug. 8, 1929.
- Miss M. M. McPhee, Secretary until August 6, 1929. Office Assistant until Nov. 30, 1929 (resigned).
- Miss J. J. Barnstead, Secretary (from August 6, 1929).
- Miss E. C. Alexander, Office Assistant (resigned Sept. 11, 1929).
- Mrs. Esther Stevens, Office Assistant (from Jan. 6, 1930).
- Mr. C. K. Darrach, Factor.
- Mr. Erlyn Harrigan, Caretaker at Eastern Passage Laboratory during season and retained as assistant at Halifax (from June 17, 1929).

TEMPORARY STAFF

- (1) *Scientific Assistants*—
- Mr. A. S. Cook (July 1-September 16, 1929).
- Mr. D. LeB. Cooper (July 2-September 14, 1929).
- Mr. G. O. Langstroth (July 2-September 24, 1929).
- (2) *Assistant for Technical Processes*—
- Mr. W. W. Stewart (May 20-September 30, 1929).
- (3) *Inspectors of Ice Fillets*—
- Mr. M. H. Friedman (resigned May 13, 1929).
- Mr. A. S. McFarlane.
- Mr. H. L. A. Tarr (resigned September 19, 1929).

Since these names were not mentioned in the report for 1928-29, it may be recorded that they commenced work with the Board on March 27, 26 and 28, 1929, respectively.

(4) *Laboratory Assistants—*

Mr. E. W. Barnstead (May 6-September 7, 1929).

Mr. H. B. Robertson (June 28-August 31, 1929) at Eastern Passage Laboratory.

The following were special instructors during the Course for Fishermen (January 22-March 4, 1930):—

Mr. Carl Johnson, Motor Engines.

Prof. R. Maxwell, Natural Resources.

Captain H. M. O'Hara, Navigation.

Mr. Joel Smith, Preparation of Dried and Boneless Fish.

By courtesy of the Department of Marine and Fisheries Mr. George Earl and Mr. Robert Gray gave courses in the Preparation of Dried and Boneless Fish and in the Preparation of Pickled Fish, respectively. Similarly by courtesy of the Department of Natural Resources of Nova Scotia Dr. M. Cumming and Prof. W. V. Longley gave courses in Natural Resources. These four persons received no remuneration from the Biological Board.

In addition to the above there were a number of persons tried out as laboratory and office assistants for periods not exceeding two weeks. For various reasons their employment did not continue.

INVESTIGATIONS

1. *Refrigeration.*—The main investigations of the Station continued to be directed at problems in connection with refrigeration. The problems were attacked from a number of angles, viz:

- (a) The determination of the heat conductivity of fish muscle, frozen and unfrozen. A formula was developed for predicting the time of freezing if the conductivity, thickness of fish and temperature of the refrigerating medium are known. The conductivity was determined for cod, haddock, herring, mackerel and salmon.
- (b) Investigations on effect of storage temperature on frozen fish. A continuation and elaboration of experiments commenced in 1928. After storage for one year for cod it was shown that storage at -20°C . (-4°F .) was satisfactory, while at -5°C . (23°F .) spoilage was very marked. Intermediate temperatures gave graded results. The changes in expressible fluid were measured and attempts made to work out a better method of measuring the amount of this fluid. The bacteria and moulds which were in part responsible for the spoilage were investigated. An attempt was made to analyze some of the chemical changes in the frozen material under storage. Similar storage experiments at -20°C . were begun using haddock, and a new series of cod. These were stored with protection from the atmosphere of the storage room, and without complete protection to determine whether odours from other fish, etc., affected the flavour. This series is in progress.
- (c) An improved type of tank for holding fish previous to processing was built and experiments continued on this method of holding fish at a lower temperature than can be obtained with ice. The additional use of chlorine solutions was tried, but no positive benefit could be demonstrated from treatment of the fish with chlorine in various ways.
- (d) Improvements were made in the jacketed cold storage room in the demonstration building whereby the air circulation was under better control. Tests conducted afterwards proved the value of this room for storage in that evaporation from exposed surfaces was reduced to from one-fifth to one-sixth of what it was in an ordinary type of room at an equivalent temperature.
- (e) The freezing point for lobster meat was determined to be 28.5°F .

2. *Smoking*.—The investigations of the fundamental constitution of wood smoke were continued and as in previous years were particularly concerned with the formaldehyde content. Technical difficulties are involved in the estimation of this substance, and the work has been largely exploratory.

As a means of speeding up the smoking process for fish electrical precipitation was attempted with promising results. The desired colour could be obtained in as short a time as fifteen minutes using this method.

With a view to making the smoking of fish independent of the weather, laboratory experiments were carried out using conditioned air for the preliminary drying of the fish. As there was some question of untreated smoke being suited for introduction into chambers through ducts and fans owing to the deposition of tar and subsequent clogging of these parts, smoke was de-tarred by electrical means and found to be satisfactory in producing colour and flavour in the fish exposed to it. The larger, semi-commercial experiment could not be undertaken until the demonstration building was completed.

3. *Salting and Drying*.—The fundamental investigations of the relation between water, salt and protein were continued. A report for publication dealing with these investigations was nearly complete at the end of the year.

Practical tests were carried out on the salting of fish with seven different commercial salts. The product was tested with regard to colour and keeping qualities. This test was carried through twice using different quantities of salt. In the first series an unexpected result was obtained which indicated that an 85 per cent saturated solution was not sufficient to prevent the growth of bacteria and moulds which caused spoilage. The second series indicated that the solar salts gave a whiter fish than the mined salts.

The routine analysis of commercial fishery salts was continued.

4. *Canning*.—Spring mackerel were brine frozen, stored for a time, and then canned in one-pound cans, following a procedure adopted the year previous with fall mackerel. They were compared in flavour with the fall mackerel similarly treated and with spring mackerel which had been canned without freezing. The product was considered to be satisfactory in every way.

Plans were drawn up for a model lobster cannery and also for an inexpensive exhaust box. These plans are available for those interested.

The canning of scallops was investigated with a view to preventing the troublesome disintegration of the muscle. Mr. Hess made use of facilities at the Atlantic Biological Station, St. Andrews, N.B., to carry out this work. He was unable to find a satisfactory solution of the problem and recommended that refrigeration was a more suitable means of handling this product.

Experiments were carried out in an attempt to explain the presence of small crystals in lobster cans and also a slimy condition frequently observed. Preliminary reports have been submitted but final examination of the cans has not been completed.

5. *Fish Oils*.—The effect of freezing of fish livers on the production of oil was further investigated. It was found that freezing of the livers increased the yield of oil when cooking was resorted to. It was found that livers could be frozen, ground up and pressed after thawing, but without cooking, and that they would yield a higher amount of number one oil than could be obtained by cooking. It was subsequently found that a very similar process was patented in the United States.

The relative merits of centrifuges and presses for removing oil from liver chum were investigated.

6. *Fish Meal*.—Routine analyses of samples of fish meal provided by the trade were carried out. Certain lobster meals proved difficult in that some

fifteen per cent of the material could not be accounted for. Determinations of total carbon and total nitrogen have been made in a number of ways with a view to finding the error. A considerable portion remains unaccounted for. Fish meals were made and analyzed using specific portions of different kinds of fish.

7. Other Laboratory Investigations.—Determinations were made of the quantity of heat produced during rigor and subsequently in fish muscle. This is important in the holding of unfrozen fish after death.

A systematic study of the bacteria of sea water and in particular of those found on and in fish was begun, and the effect of temperature on certain organisms responsible for spoilage was investigated.

General investigations on the nature of fish proteins were carried on.

Several methods of measuring spoilage in fish after death were investigated chiefly one involving the estimation of trimethylamine oxide, and one dealing with the estimation of amino acids by ninhydrin. None of these tests proved to be of sufficient delicacy to detect the early changes which are important commercially.

The problem of migration of water in fish muscle particularly under conditions when frozen was investigated.

DEVELOPMENT OF THE STATION

Two storeys were added to the Demonstration building, which adds four rooms each 18 feet by 32 feet to this building.

A contract was let in September for the construction of a permanent building.

ICE FILLETS

During the fiscal year 1929-30 the following quantities of Ice Fillets were manufactured at the Station and shipped for sale in Toronto:—

	lbs.
Haddock.....	4,317
Cod.....	3,408
Halibut.....	2,936
Russet Flounder.....	1,464
Gray Flounder.....	3,300
Mackerel.....	528
Swordfish.....	168
Cusk.....	240

In addition small quantities were disposed of in Halifax, Ottawa and Montreal.

By means of the ice fillets inspectors the production of the ice fillets by the Lunenburg Sea Products Co., Ltd., and the Lockeport Company, Ltd., was supervised during the year.

EDUCATIONAL WORK

1. Courses for Fishery Officers.—The first course for fishery officers which was in progress when the fiscal year began continued until April 16, 1929. A second course to another group began on April 17 and closed on May 28, 1929. The first course was attended by three Inspectors, seventeen Overseers and five officials from Quebec; and the second course by nineteen Overseers and five officials from Quebec. Each course included instruction in biology, chemistry, and physics, bacteriology, motor engines, navigation, natural resources, preparation of dried and boneless fish, preparation of pickled fish. An examination was held at the termination of the course.

2. Course for Fishermen.—So far three schools of instruction have been held. The first took place in January-February, 1928, at which there was an

attendance of nineteen; the second took place in January-February, 1929, at which there was an attendance of twenty-five; the third took place from January 22 to March 4 of the present year, at which there was an attendance of twenty.

The board, from its funds, offered to pay to each fisherman who attends the six weeks course his double railway fare between Halifax and the railway station nearest his home, in addition to a grant of \$45 towards his maintenance when in Halifax at the school. The school was made available only to bona fide fishermen between the ages of seventeen to thirty-five, and who had reached a certain educational grade in the lower schools.

The instruction at the school for the present year was given in the form of six separate courses; each course was in the hands of a highly qualified instructor. The classes began at nine a.m. each morning. Four classes of fifty minutes each constituted the morning session and three classes of fifty minutes each the afternoon one. The subjects of the various courses were as follows:—

(1) *Preparation of Dried and Boneless Fish.*—This comprised practical instruction in heading, splitting, washing, salting and drying fish, also in the preparation of boneless fish, drying and boxing. Each man prepared one thirty-pound box of boneless fish and a quantity of dried fish. Discussions were held on the problems applicable to the various districts from which the fishermen came.

(2) *Preparation of Pickled Fish and the Coopering of Barrels.*—Practical instruction in ripping, scraping, washing, packing and grading herring. The testing of barrels. Each man was required to prepare and pack a quantity of herring in each of the various ways taught.

(3) *Motor Engines.*—This comprised work in dissembling, assembling and repairing gasoline engines, theory of gasoline engines, two and four cycle, carburetors, lubrication, electrical equipment, valves, crude oil engines.

(4) *Navigation.*—This comprised lectures and demonstrations and practical chart work, shaping courses and measuring distances, charts, effect on engine on compass, magnetic compass, magnetic poles, latitude and longitude, Mercator's chart, finding magnetic courses, nautical astronomy, true chart meridian altitudes, turning true courses into magnetic ones, the sextant, fixing ship's position, longitude and time.

(5) *Science.*—This comprised lectures, with demonstrations whenever possible, some of the experiments and microscopic examinations being carried out by the students themselves. The subjects taught under this heading were:—

(a) *Chemistry and Physics*, which included molecules and atoms, heat and temperature. Measurement of heat and temperature. Thermometers. Specific heat and latent heat. Gases, pressure, volume and temperature. Atmospheric pressure. Barometers. Solutions. Saturation of solutions. Density and specific gravity. Hydrometers. Osmosis. Theory of fish salting. Salt and its constituents. Vapour pressure. Evaporation and boiling. Condensation and liquefaction of gases. Composition of atmosphere. Humidity. Properties of oxygen, hydrogen, carbon dioxide. Respiration of plants and animals. The water cycle. Ice and steam.

(b) *Biology and Conditions in the Sea*, which included most important fishes, methods of fishing, location of fish. Migrations. Life-histories of cod, haddock, herring, mackerel and lobsters. Food, rates of growth. Reproduction. Habits and distribution. Seasons in the water. Effect of ice. Effect of tides. Drift bottles. Circulation of water. Effect of physical conditions on distribution of animals.

- (c) *Bacteriology*, which included micro-organisms and plant and animal diseases, fermentation and spoilage of food. Shapes and forms of bacteria. Examinations of bacteria and their distribution in nature. Bacteria of sea water and fresh fish. Factors influencing bacteria in fish. Bacteriology of cured fish, chilling, freezing, drying, smoking, pickling, salting and canning.
- (d) *Refrigeration*, which included Composition and structure of fish muscle. Freezing of salt solutions. Effect of freezing on tissues. Effects of storage. Rapid freezing of bait. Type of freezing tanks. Salt penetration. Types of commercial freezers.
- (e) *Fish Oils*, which included sources of oils, whale oil, menhaden and herring oil, other fish oils, liver oils. Methods of preparation, including actual preparation of cod liver oil by steaming.
- (f) *Food Chemistry*, which included the chemistry of fish when used as food. Nutritive value of food fishes.

(6) *Natural Resources*.—This comprised instruction in goods, wealth, production, division of labour, exchange, theory of value, demand and supply, value and cost of production. Organization, stocks and bonds, trusts, holding companies, banking operations. Co-operation, co-operative marketing, its history, weaknesses, agencies and types. Market information. Cultivation of soil, potato growing, gardening, vegetable growing, and a general talk on the marketing of fish.

Under miscellaneous classes there was given instruction in methods of fish handling, also discussions on the methods of fishing in various sections of the coast. A few illustrated lectures were given in the evenings on such subjects as "Life in the Sea", "Methods of Fishing", "All Flesh is Grass", "The Nature of Sound", and a series of motion picture films dealing with commercial and sport fishing on the Atlantic and Pacific coasts was shown to the class.

The school continued for six weeks. On the closing day written examinations of one hour's duration were held in each of the six major subjects of the course, in order to test the extent to which the instruction was absorbed by the students. In the subject of Preparation of Dried and Boneless Fish ten questions were set. In the subject of Preparation of Pickled Fish and Coopering of Barrels seventeen questions were set. There were ten questions on the subject of Motor Engines. In Navigation there were sixteen questions. In Science there were seven questions. In Natural Resources there were eight questions.

To secure honours the examiners decided that an average of over seventy-five marks for the six subjects, and not less than forty in any one subject, would be necessary. For a pass, however, an average of forty in the six subjects, with no minimum for any one subject, was considered sufficient.

Four of the twenty students passed with honours, one obtained an average of ninety for the six subjects, his lowest in any subject being eighty-one. Fourteen passed, and two failed to make the pass standard.

3. *Dalhousie Course for B.Sc. in Fisheries*.—The portions of this course given by the board commenced on September 30, 1929. There is one student taking all five courses and there are three taking three courses. The courses as given are:—

- (1) General Fisheries: Dr. A. H. Leim.
- (2) Physics and Chemistry of Fish Curing: Dr. J. H. Mennie.
- (3) Fish Culture: Dr. A. H. Leim.
- (4) Bacteriology of Fish Curing: Dr. J. R. Sanborn.
- (5) Biochemistry of Fish Curing: Mr. S. A. Beatty.

FIELD WORK

At the request of the Department of Fisheries Mr. Hess visited the Magdalen Islands, Quebec, from June 12 to 24. He reported on conditions in some twelve lobster canneries and gave demonstrations at each of the importance of speed and cleanliness in the cannery procedure. While there he put up a pack for his experiments on crystals and slime in lobster cans.

The Station conducted an exhibit of brine freezing methods at the Provincial Exhibition at Halifax during the last week in August. This was repeated at the Exhibition in Lunenburg in September 16 to 21.

Dr. Chipman installed recording thermographs on two boats running to the West Indies, the *Lady Drake* and the *Lady Hawkins* and subsequently kept in touch with their operation. This was in connection with hydrographic work for the Atlantic Biological Station. He also visited Sambro Island to check up on records there in a similar connection.

Further investigation of the water supply at the Windsor hatchery was carried out for the St. Andrews Station during the summer of 1929 by Messrs. Beatty, Chipman and Leim.

PLANKTONIC AND HYDROGRAPHIC INVESTIGATIONS

Regular observations of temperature and collections of plankton were made at two stations situated in Halifax Harbour (weekly) and Bedford Basin (bi-weekly) during the year. Observations at less frequent intervals during the fishing season were made at a station at the entrance to the harbour.

EASTERN PASSAGE LABORATORY

During the year the laboratory was fitted up with tables, tanks for salt water, pumps, running fresh and salt water and gas machine. A well was dug, a road constructed on the property and a wharf built.

The station was open for scientific work only during the summer months. The Scientific Director was Professor J. N. Gowanloch. Dalhousie University, through Professor Gowanloch, conducted a summer course in marine biology for two students taking the fisheries course.

So far as the work coming directly under the Board was concerned there were five volunteer investigators at the laboratory. Their names, universities, dates of attendance and problems follow:—

- Miss Eleanor M. L. Chesley, Dalhousie University, June 25-August 27, "Light reactions and schooling activities in fishes (e.g. pipefish and *Gasterosteus*)".
- Miss Elizabeth G. Frame, Dalhousie University, July 5-August 4, August 11-31, "Studies on the Blood of Fishes: Haematopoiesis".
- Miss K. K. Holman, Dalhousie University and University of Toronto, June 17-August 15. "Origin of pattern in the alimentary tract of Fishes".
- Miss I. Irvine, Dalhousie University, July 4-August 31. "The effect of feeding mackerel gibbs to lobster. Age Studies on Haddock".
- Miss A. J. Macauley, Dalhousie University, June 24-August 23. "Thermolethal points of Crustacea from surface and deep waters".

PUBLICATIONS

The following publications dealing with the work of the station appeared during the year:—

- Wynne, A. M.—"The tryptic hydrolysis of haddock muscle.—Preliminary report". *Contrib. to Can. Biol. and Fish.* N.S. Vol. 4, pp. 317-341, 1929.
- Hess, Ernest.—"The Fishing Industry discovers how Smoke Preserves". Food Industries, February, 1929.
- "The amount of Dry Meat in Canned Lobster in Relation to Exhausting and to the age of the Can." *Contrib. to Can. Biol. and Fish.* N.S. Vol. 5, pp. 93-105, 1929.

The following Manuscript Reports of the Experimental Stations were issued from Halifax:—

- No. 20. Langstroth, G. O.—“Heat capacity of fish muscle; latent and specific heats”.
- No. 21. Wyman, H. R.—“The effect of temperature of cold storage on the expressible fluids in fish muscle”.
- No. 22. Langstroth, G. O.—“Preliminary work on the specific conductivity of fish muscle”.
- No. 23. Ross, R. F.—“A preliminary study of the shrinkage of crustacean and fish muscle when exposed to changes in salt concentration and temperature”.
- No. 24. MacFayden, D. A.—“The Investigation of Drip and Juice available for drip in Frozen Fish”.
- No. 25.—Branion, H. B.—“Some observations on the Manufacture and Vitamine Content of Cod Liver Oil and Allied Oils”.
- No. 26. Langstroth, G. O.—“On the rate of freezing of fish muscle. 11”.
- Reports received during the Period:—
- Stewart, W. W.—“The relation between storage and the amount of expressible juices from sardine waste”.
- Rice, Christine E., and Hess, Ernest.—“The effect of temperature upon the rate of decomposition of haddock muscle”.
- Hess, Ernest.—“Autolytic and bacterial decomposition of haddock muscle at low temperatures above freezing”.
- Hess, Ernest.—“The Canning of brine frozen mackerel”.
- Cooper, D. LeB.—“Further experiments on wood smoke in connection with the fish smoking industry. Part II.”
- MacFayden, D. A.—“Report of the summer 1927. The investigation of Drip and Juice available for Drip”.
- Hess, Ernest.—“The influence of storage temperature on the quality of canned lobster”.
- Hess, Ernest.—“Report on an inquiry among the lobster canners of the Maritime Provinces with regard to ‘Exhausting’”.
- Hess, Ernest.—“Some preliminary Notes on the Canning of Scallop”.
- Hess, Ernest.—“The amount of Dry Meat in Canned Lobster in relation to Exhausting and to the age of the Can”.
- Hess, Ernest.—“Report on a survey of the lobster canneries and canning conditions on the Magdalen islands (P.Q.)”.
- Branion, Hugh.—“Some observations on the manufacture and Vitamine content of Cod Liver Oil and Allied Oils”.
- Hess, Ernest.—“Preliminary Report on an Investigation regarding Crystal Formation in Canned Lobster”.
- Tarr, H. L. A.—“Some data secured during short trip on Trawler ‘Lemberg,’ operated by National Fish Company, Halifax”.
- Hess, Ernest.—“The preservation of scallops”.
- Hess, Ernest.—“Preliminary Notes on the Action of Formaldehyde on the bacterial flora of haddock.”
- Langstroth, G. O.—“On the rate of freezing of fish muscle”.
- Langstroth, G. O.—“Rate of Heating of Cylinder”.
- Langstroth, G. O.—“A note on the heat change in haddock muscle during rigor mortis”.
- Langstroth, G. O.—“Preliminary Note on the Rate of Decay of Fish Muscle”.
- Hess, Ernest.—“Examination of Lobster Cans”.
- Hess, Ernest.—“Canning of Brine Frozen Mackerel”.
- Hess, Ernest.—“The principles involved in the smoke curing of fish”.
- Mennie, J. H.—“Investigation of Lobster Meal”.
- Cook, A. Stanley.—“Trimethylamine Oxide in Fish Muscle”.
- Chipman, H. R.—“Report on Accuracy of Winkler Method for Oxygen”.
- Chipman, H. R.—“Report on Course for Fishermen, 1930”.
- Cooper, D. LeB.—“Report to the Biological Board of Canada. Being the Result of Work carried out at the Fisheries Experimental Station (Atlantic) during the summer of 1929, Section I—The estimation of formaldehyde in wood smoke distillates. Section II—Preliminary experiments on an apparatus for shortening the time necessary for smoking fish”.

PACIFIC BIOLOGICAL STATION, NANAIMO, B.C.

The Station now consists of two laboratories, biological and chemical, a residence building for the accommodation of scientific workers, a bungalow for the director, and a caretaker's cottage. It possesses a sixty-foot motor boat, two thirty-four-foot fishing boats, a small open launch and several row-boats. The laboratories are equipped with apparatus for general biological,

chemical and oceanographical investigations and are provided with running fresh and salt water, gas and electricity. There is a working library of books, journals, and separates.

INVESTIGATORS

The research program is being carried forward by two groups of workers. One is the permanent staff which is engaged directly upon fishery problems. The other is a group of members of the staffs of the Universities of Canada and certain advanced graduate students. These workers spend several months each summer upon various problems, which may or may not have immediate economic bearings. In this way many of the best trained scientists of the Dominion contribute to the advancement of the research program along fundamental lines and they carry back to the Universities an interest in general oceanographical research and the training of younger persons in fisheries, oceanographical and limnobiological research is thereby stimulated.

STAFF

Dr. W. A. Clemens, Director.
 Dr. R. E. Foerster, Associate Biologist.
 Dr. J. L. Hart, Assistant Biologist.
 Dr. A. L. Pritchard, Scientific Assistant.
 Mr. C. R. Elsey, Scientific Assistant.
 Mr. G. H. Wailes, Temporary Assistant Pilchard Investigation.
 Mr. C. McC. Mottley, Temporary Assistant Trout Investigation.
 Mr. L. L. Bolton, Temporary Assistant Salmon Tagging.
 Dr. W. W. Simpson, Temporary Assistant Salmon Tagging.
 Mr. Ross Whittaker, Temporary Assistant Salmon Tagging.
 Mr. D. Beall, Temporary Assistant Salmon Tagging.
 Mr. H. J. Alexander, Temporary Assistant Salmon Tagging.
 Mr. R. Wilson, Temporary Assistant Salmon Tagging.
 Mr. L. McHugh, Temporary Assistant Salmon Tagging.
 Mr. H. G. Glover, Temporary Assistant Salmon Tagging.
 Mr. T. C. Wheeler, Temporary Assistant Salmon Tagging.
 Mr. J. H. Stannard, Temporary Assistant Salmon Tagging.
 Miss E. Keighley, Secretary and Librarian.
 Miss E. Robinson, Temporary Typist.
 Mr. Fred Groth, Captain "A. P. Knight."
 Mr. J. A. Randle, Engineer "A. P. Knight."
 Mr. Edgar Black, Deckhand "A. P. Knight" (summer).
 Mr. Thos. Russell, Caretaker.
 Mr. Sherman Deno, Groundsman.
 Miss E. Edwards, Housekeeper (summer).
 Mrs. E. Riches, Cook.
 Miss Winnie Riches, Maid.
 Miss Hazel Neen, Maid (summer).
 Miss Violet Foster, Maid (summer).

Voluntary Investigators—

Miss A. Berkeley, University of Toronto.
 Mr. C. Berkeley, Nanaimo.
 Mrs. C. Berkeley, Nanaimo.
 Miss M. H. Campbell, University of British Columbia.
 Miss M. Crawford, University of Toronto.
 Miss J. F. L. Hart, University of British Columbia.
 Dr. A. H. Hutchinson, University of British Columbia.
 Mr. C. C. Lucas, Brandon College.
 Miss V. Z. Lucas, University of British Columbia.
 Mr. M. MacPhail, University of British Columbia.
 Mr. J. A. Munro, Okanagan Landing.
 Miss Jean Pantou, University of Toronto.
 Prof. R. A. Wardle, University of Manitoba.
 Mr. G. V. Wilby, North Dakota Agricultural College.

INVESTIGATIONS

1. *Propagation of Sockeye Salmon.*

A. *Relative Efficiencies of Natural and Artificial*—Dr. R. E. Foerster continued his studies at Cultus lake. It will be recalled that the program was planned to determine the efficiency of artificial propagation as compared with natural. Fences were installed in the outlet from Cultus lake so that adult fish coming to the lake and seaward migrating young leaving the lake could be counted. In the years of natural propagation the sockeye returning to Cultus lake are stopped by a picket weir below the lake, trapped, numbers of each sex determined, and then released from the traps to proceed to the spawning beds. In such years a count of male and female adults alone is necessary. Since each female contains, on the average, 4,500 eggs, the total number of eggs which should be deposited in the spawning nests can be computed and the subsequent counts, eighteen months later, of the seaward migrating young resulting from the spawning will determine the percentage of efficiency of natural propagation to this stage. Two methods of artificial propagation are in use at the present time. In one, the eggs are hatched in the hatcheries and the fry liberated into lakes and streams. In the other, the eggs are held only until they reach what is called the "eyed" stage when they are planted by means of a planting box in the gravel bars of streams. These two methods are being tested at Cultus lake, where there is a hatchery. In the years when eggs are being taken for fry or egg planting, no sockeye are allowed to spawn naturally in the lake. The seaward migrants resulting from the above methods of artificial propagation are counted and the percentage of efficiency determined.

In the spring of 1929, the yearling seaward migrants of the natural spawning in the fall of 1927 were counted. They totalled 2,453,634. In the fall of the same year all the fish, 15,000, were stopped at the weir and the eggs collected. Approximately 3,000,000 were subsequently planted in the gravel of the streams tributary to the lake and the remainder transferred to other areas. The following shows the results at Cultus lake to date:—

Year	1925	1926 Fry	1927	1928 Egg Planting	1929 Fry
Method propagation.....	Natural	Artificial	Natural	Artificial	Artificial
Total males.....	1,540	3,122	25,659	3,878	1,244
Total females.....	3,883	1,949	55,569	11,461	3,079
Total eggs contained in all females.....	17,473,500	8,770,500	250,060,500	51,700,571	13,855,500
Total eggs collected.....		6,487,000		32,656,624	10,800,000
Per cent of total eggs.....		74		63.2	76
Downstream Migrants; Fry.....	12,568		116,977		
Per cent of total eggs.....	0.07		0.05		
Yearlings.....	183,272	336,257	2,453,634		
Per cent of total eggs.....	1.05	3.83	0.98		
2-year-old.....	1,722	10,972			
Per cent of total eggs.....	0.01	0.13			
Total migrants.....	197,562	347,229			
Per cent of total eggs.....	1.13	3.96			

B. *Transference of Eggs from One Area to Another.*—In order to test the success of transplanting sockeye from the lower Fraser area to the upper, 500,000 eggs were taken from Cultus lake in the fall of 1928 to Taft, on Eagle river, where they were hatched and the fry placed in retaining ponds. The fry were held until the fall of 1929 when they were marked by means of clipping the fins and then released into Eagle river. A fence for intercepting any return will be installed in the river.

C. *Efficiency of Pond System in Artificial Propagation.*—It is planned to hold sockeye fry in ponds at Cultus lake for approximately six and 12 months and by marking the young fish at the time of release to determine the percentage of survival for each period of retention by counting the seaward migrants.

D. *Hybridization.*—In the fall of 1927 the presence of individuals of the five species of Pacific salmon at Cultus lake offered an opportunity to carry out experiments in the crossing of the several species of Pacific salmon in order to determine the possibility of such a phenomenon in natural spawning, and the probable effect. At the same time some attention was given to the possibility of investigating the effect of selective breeding.

Comparatively good success was attained with the following crosses and the individuals resulting are now being retained in ponds at Smith Falls hatchery:—

Female		Male	Female		Male
Spring.	.....	Pink	Sockeye	.....	Chum
Spring.	.....	Coho	Sockeye	.....	Spring
Pink	.....	Sockeye	Sockeye	.....	Pink
Pink	.....	Chum	Coho	.....	Pink
Pink	.....	Spring	Chum	.....	Spring

It would seem, therefore, that, as far as the power of fertilization and successful hatch are concerned, the above crosses are quite possible under natural conditions. Whether the adults resulting from such crosses would be fertile or sterile remains to be seen.

From an examination of the growth and relative condition of the various hybrid salmon it would seem that the Sockeye female x Chum male, Sockeye female x Pink male, and Pink female x Sockeye male groups would prove most interesting crosses to rear and study from the viewpoint of selective breeding.

2. *Pink and Chum Salmon Investigation.*—Studies are being carried out by Dr. A. L. Pritchard along three lines:—

(a) *General life-histories.*—First, attention has been given to the Queen Charlotte Islands area where practically every stream and lake has been surveyed. Observations have been made of the principal pink and chum salmon runs, of the spawning habits, of the seaward migration of fry and of local races.

(b) *Propagation.*—Careful observations of natural propagation have been made and plans are being developed for installing counting fences in a stream in order to obtain accurate data as to the success of natural spawning of pink salmon. In 1931 an attempt will be made to establish a run in the "off" year.

(c) *Statistical.*—The statistics of the pink and chum salmon runs in various areas along the coast are being worked up.

3. *Salmon Tagging.*—In 1925 an extensive salmon tagging program was commenced in British Columbia for the purpose of securing accurate information concerning the migration routes of all the five species of Pacific salmon. In each year for the past five years, operations have been carried out at various locations along the coast and there is rapidly being obtained a body of information of exceptional value from the scientific and administrative points of view, and of great general interest.

In carrying out the work, there are certain difficulties associated with the nature of the salmon fishing. It has been found from one experiment that fish caught in gill nets are so weakened that only a very small percentage survive after release. Moreover, gill netting is generally carried on at and in the mouths of rivers, and the fish caught in the gill net areas are moving largely into the streams of those areas and their ocean migrations are practically at an end.

In the case of seine fishing, it has been found impossible to successfully tag on board the seine boats, chiefly because of lack of space and of inconvenience caused to the fishermen. In order to tag seine-caught fish, it has been necessary to supply the taggers with boats and small live boxes so that they can follow the seine boats, secure some of the fish, and tag these out of the way of the seine boat operations. Tagging at traps offers few difficulties but at the present time this type of gear is used at the south end of Vancouver island only. Systematic tagging has not yet been attempted there as it seemed more important to obtain information elsewhere. Advantage was taken of the trap operation at Wales island in the north, in 1925. The most successful tagging of spring and coho salmon has been done on board the trolling boats. Taggers have accompanied the trolling boats to sea, selected and tagged the fish as caught.

Perhaps the most startling results have been obtained from the tagging of spring salmon off the west coasts of Vancouver island and the Queen Charlotte islands. A summary of the tagging of spring salmon during the years 1925, 1926 and 1927 is given herewith:—

1. Ucluelet, 1925.

From May 23 to June 25, 1925, 1,125 individuals ranging in weight from 5 to 58 pounds were tagged and there have been 122 recaptures (10 per cent). The returns are as follows:—

	1925	1926	1927
Barclay Sound area.....	1	7	.....
Cape Flattery area.....	1	2	.....
Strait of Juan de Fuca, B.C. waters.....	5	2	.....
Strait of Juan de Fuca, Washington waters.....	2	3	.....
Puget Sound area.....	13	.....	.....
Fraser river.....	4	1	.....
Coast of Washington.....	1	1	.....
Columbia river.....	42	25	7
Coast of Oregon.....	2	.....	.....
Sacramento River, Cal.....	2	.....	.....
Unknown.....	.....	1	.....
	73	42	7

It will be seen that 25 per cent of these fish turned into the strait of Juan de Fuca, while 65 per cent passed down the coasts of Washington, Oregon and California. The recaptures in the Columbia river amounted to 60 per cent of the total.

2. Ucluelet, 1926

The tagging in 1925 was carried out over a period of one month only, and so the operations of 1926 were designed to determine if the southward movement indicated by the 1925 operations extended throughout the whole fishing season. The work was therefore carried out from March to September and 1,353 fish were tagged. The returns have been 177 (13 per cent).

	1926	1927	1928
Clayoquot Sound area.....	2	1	.....
Barclay Sound area.....	4	.....	.....
Cape Flattery area.....	1	1	.....
Strait of Juan de Fuca, B.C. waters.....	9	.....	.....
Strait of Juan de Fuca, Washington waters.....	4	1	.....
Puget Sound area.....	26	2	2
Fraser river.....	9	1	1
Coast of Washington.....	1	1	1
Columbia river.....	71	34	1
Unknown.....	1	2	1
	128	43	6

The returns are essentially similar to those from the 1925 tagging. The fish which turned into the strait of Juan de Fuca amounted to 31 per cent while those continuing on down the coast formed 62 per cent. The recaptures in the Columbia river amounted to 60 per cent of the total.

Examination of the returns in the year 1926 shows that the distribution from each month of tagging was essentially similar to the total distribution. From the April tagging, 41 per cent of the returns were from the strait of Juan de Fuca and 60 per cent from farther south; in May, 27 and 70 per cent; June, 34 and 59 per cent; July, 15 and 77 per cent; August, 29 and 57 per cent respectively.

3. Quatsino, 1927

The destination of the spring salmon appearing farther up the coast then became a matter of enquiry and in 1927 tagging operations were commenced at Quatsino sound in February 14 and continued until March 30. The fishing in this season was comparatively poor and only 54 individuals were tagged. There have been 7 recaptures (12 per cent) as follows:—

Barclay Sound area.....	1
Puget Sound area.....	2
Columbia river.....	4

While the returns are few, the percentages from the strait of Juan de Fuca (28 per cent), the coast of Washington (57 per cent), and the Columbia river (57 per cent), are similar to those obtained from the Ucluelet tagging.

4. Kyuquot, 1927

Following the failure of the fishing in the Quatsino area, tagging was carried out off Kyuquot sound from April 26 to July 16, when 517 fish were tagged. The returns to date have been 73 (14 per cent) as follows:

	1927	1928
Clayoquot Sound area.....	1	
Barclay Sound area.....	3	
Cape Flattery area.....	4	
Puget Sound area.....	4	1
Fraser river.....		1
Queen Charlotte Sound area.....		1
Coast of Washington.....	6	
Columbia river.....	47	
Coast of Oregon.....	2	
Unknown.....	2	1
	69	4

There may be additional returns in 1929. At the present time the percentages of fish going into the strait of Juan de Fuca and down the American coast are very different from those of the other tagging records as given above. Only 8 per cent of the returns were from the strait of Juan de Fuca while 75 per cent were from farther south. The percentage from the Columbia river, 64 per cent, is practically in agreement with those from the other west coast tagging operations.

5. Hippa Island, West Coast Queen Charlotte Islands

In 1925 tagging operations were carried out at Hippa island from June 20 to July 25. A total of 274 individuals were tagged and of these 37 (13 per cent), have been recaptured.

	1925	1926
Skeena river.....	2	
Nass river.....		1
Prince of Wales Island, Alaska.....		1
Barclay Sound area.....	2	
Strait of Juan de Fuca, British Columbia waters.....	1	
Puget Sound area.....	2	
Fraser river.....	4	
Coast of Washington.....	1	1
Columbia river.....	7	3
Coast of Oregon.....	12	
	31	6

In the case of the returns from this tagging the percentages from the strait of Juan de Fuca (19 per cent), and down the coast (65 per cent), are in fairly close agreement with the previously described tagging results but the percentage from the Columbia is lower (27 per cent). The returns from the streams of Oregon from the Nehalem river to Coos bay, were relatively numerous forming 32 per cent of the total returns.

A summary of the percentages referred to above is given herewith:—

	Strait of Juan de Fuca	American Coast, including Columbia River	Columbia River
1. Ucluelet, 1925.....	25	65	60
2. Ucluelet, 1926.....	31	62	60
3. Quatsino, 1927.....	28	57	57
4. Kyuquot, 1927.....	8	75	64
5. Hippa, 1925.....	19	65	27

It is probable that the majority of those which turned into the strait of Juan de Fuca were bound for the Fraser river.

It is interesting to note the percentages of the returns obtained in each year:—

	1925	1926	1927	1928
Ucluelet, 1925.....	60%	35	5	
Ucluelet, 1926.....		72	24	4
Kyuquot, 1927.....			95	5
Hippa island, 1925.....	84	16		

The rates at which some of the fish travelled are remarkable as the following indicate:—

Hippa Island to Columbia river, 650 miles, 19 days, 34 miles per day.

Ucluelet to Columbia river, 265 miles, 11 days, 24 miles per day.

Ucluelet to Sooke, 105 miles, 7 days, 15 miles per day.

Ucluelet to New Westminster, 141 miles, 14 days, 11½ miles per day.

Ucluelet to Sacramento river, 820 miles, 76 days, 11 miles per day.

THE TAGGING OF COHO SALMON

The results from the tagging of coho salmon in the waters of British Columbia during the years 1925, 1926, 1927 and 1928 are here presented in very brief form:—

1. *Uchuelet, 1925*

During the months of May and June 51 individuals were tagged and 5 (10 per cent), were recaptured. The returns were as follows:—

Barclay Sound.....	1
Cape Flattery.....	1
Sooke.....	1
Puget Sound.....	2

2. *Uchuelet, 1926*

The tagging period was more extended covering the months of April to September and 180 fish were tagged. The recaptures numbered 11 (6 per cent), and were as follows:—

Alberni canal.....	1
Hesquiat.....	1
Cape Flattery.....	4
Grays harbour.....	1
Sooke.....	1
Dungeness.....	1
Howe Sound.....	1
Bute inlet.....	1

3. *Kyuquot, 1927.*

During the months of April to August, 135 individuals were tagged, and 8 (6%) were taken. The returns were as follows:—

Kyuquot.....	1
Seymour inlet.....	1
Sooke.....	3
Fraser river.....	1
Columbia.....	2

While the returns from the West Coast tagging are few, they indicate a movement into the Strait of Juan de Fuca as well as down the coast as far as the Columbia river.

4. *Deep Bay, 1927.*

There occur at practically all times of the year in the straits of Georgia large numbers of small coho salmon, frequently called by the fishermen, salmon trout, sea trout, bluebacks, etc. It was decided to tag a number of these small cohoes for the purpose of obtaining information concerning their movements, rates of growth, etc. From April 5 to June 15 there were tagged 357 individuals and 47 (13.5%) were subsequently recaptured. The returns were as follows:—

Hornby-Comox-Lasqueti district.....	7 (15%)
Cape Mudge area.....	8 (17%)
Yuculta rapids.....	2
Flower island.....	1
Half Moon bay.....	1
Jervis inlet.....	1
Nanaimo district.....	1
Porlier pass.....	4 (8%)
Duncan area.....	1
Sooke.....	1
Whidbey island.....	3
Lummi island to Point Roberts.....	2
Samish river.....	6 (13%)
Nooksack river.....	1
Nicomekl river.....	2
Fraser river.....	3
Capilano river.....	3
	1

The results thus show a wide distribution. Seven were taken in the locality where tagged, eleven (23%) went northward and twenty-six (57%) travelled southward. The periods between time of tagging and time of recapture averaged 118 days or practically four months.

Examination of representative samplings of scales showed that the tagged fish were at the commencement of their third years. They had spent one year in fresh water and one in the ocean. The average weight of the fish tagged in April was $2\frac{1}{2}$ pounds; from May 2 to 10 it was 3 pounds; from May 17 to 30 it was 4 pounds, and in early June, 4 pounds. During this period, therefore, the fish increased in weight at the rate of about one pound per month. Accepting 24 weights upon recapture as reasonably accurate, the average increase in weight during the tagged period amounted to about one-half pound per month. Upon the above basis, a coho weighing $2\frac{1}{2}$ pounds on April 15 will therefore attain a weight of about 6 pounds by September 15, possibly sooner.

5. Nanaimo, 1928.

The tagging of small coho salmon was continued in 1928 in the Nanaimo region. From February 14 to July 11 a total of 1,609 fish were tagged and the recaptures amounted to 163 (10%). The returns were as follows:—

Nanaimo area.....	21 (13%)
Qualicum.....	4
Hornby area.....	14 (9%)
Cape Mudge.....	12 (7%)
Toba inlet.....	1
Queen Charlotte sound.....	3
Porlier pass.....	1
Active pass.....	1
Crofton-Duncan area.....	3
Sooke.....	4
Swiftsure bank.....	1
Neah bay.....	2
Dungeness.....	2
Whidbey island.....	14 (9%)
Lummi island to Point Roberts.....	23 (14%)
Samish river.....	1
Skagit river.....	1
Nooksack river.....	3
Nicomekl river.....	1
Serpentine river.....	1
Fraser river.....	41 (25%)
English bay.....	1
Capilano river.....	1
Gower point.....	2
Pender Harbour area.....	4
Jervis inlet.....	2

It will be noted that the distribution of these fish was essentially the same as that of Deep Bay fish. Thirty-four (21%) of the fish went northward and ninety-nine (61%) went southward (Fraser river, English bay and Capilano river included). It is interesting to note that some individuals travelled at least to the entrance to the strait of Juan de Fuca. Twenty-five per cent of the returns were from the Fraser river and twenty-seven per cent from American waters. The average period between capture and recapture was 145 days or nearly five months.

Examination of scale samplings showed the fish to be at the beginning of their third years, having spent one year in fresh water and one year in the ocean.

The average of the estimated weights of the fish tagged in each month were as follows: February $1\frac{1}{4}$ pounds; March $1\frac{1}{2}$ pounds; April 2 pounds; May $2\frac{1}{2}$ pounds, June $3\frac{1}{2}$ pounds. These weights are considerably lower than those of the fish caught in the Deep Bay region in 1927, but the difference may be due to the fact that in 1928 special small trolling tackle was employed. The average increase in weight during the tagged period was one-half pound per month.

6. *Sooke, 1928.*

From August 13 to 23, 99 coho salmon were tagged for us by Messrs. J. H. Todd and Sons, to whom we are grateful for this assistance. The recaptures totalled 24 (24%) and the distribution was as follows:—

Sooke.....	7 (29%)
Victoria vicinity.....	2
Mill Bay.....	1
Cowichan area.....	1
Active pass.....	1
Dungeness.....	1
Dash Point (Tacoma).....	1
Salmon bank.....	2
Henry island.....	1
Deception Pass.....	2
Lummi Island to Point Roberts.....	1
Fraser river.....	4 (17%)

The general movement of these fish was evidently eastward and northward. The origin is unknown. Since four fish tagged in the Nanaimo area and three in the Deep Bay area have been taken in the traps at Sooke, some of those tagged at the trap may have come from the Strait of Georgia. The significance of the movement westward in the Strait of Juan de Fuca of cohoes in the summer of their maturity is not understood.

7. *Queen Charlotte Sound, 1928.*

From July 21 to October 17, 810 coho were tagged in the Queen Charlotte Sound area, from Bate pass near the north end of Vancouver island to Deep Water bay in Discovery passage. The localities and the number tagged in each are as follows:—

Bate pass, 27, Christie passage, 142, Hardy bay area, 36; Hanson island area, 578; Discovery passage, 27. The general distribution from these localities were similar and therefore the returns are considered as a whole. There have been 77 (9·5%) recaptures, the distribution being as follows:—

Queen Charlotte sound.....	6 (8%)
Seymour inlet.....	1
Stackhouse island.....	1
Knight inlet.....	5 (6%)
Johnston strait.....	7
Lochborough inlet.....	4
Bute inlet.....	4
Toba inlet.....	13 (17%)
Discovery passage.....	8 (10%)
Puntledge river.....	3
Nanaimo area.....	1
Jervis inlet.....	2
Howe sound.....	2
English bay.....	3
Fraser river.....	2
Serpentine river.....	11 (14%)
Puget sound.....	1
Sooke.....	3
Port Renfrew.....	1
Indian river.....	1
Unknown.....	1

It is apparent that the movement of these fish was southward and the distribution very extended. There is no evidence that the fish appearing in any of the tagging areas were bound for single spawning areas. If they occurred in schools bound for certain spawning areas, then in each locality there must have been a temporary association of many schools.

THE TAGGING OF SOCKEYE SALMON

There is given herewith in very brief form a report on the results of the tagging of sockeye salmon in British Columbia waters during the years 1925 and 1928.

1. Haystack Island, August, 1925.

From August 3 to 21, 659 sockeye were tagged and 135 or 20% were recaptured.

The fish were obtained from the trap of the Canadian Fishing Company. The returns were as follows:—

Nass river.....	80
Observatory inlet.....	1
Portland inlet.....	9
Wark inlet.....	3
Dundas inlet.....	1
Skeena river.....	13
Union passage.....	1
Alaskan waters.....	27

The greatest number were caught in the Nass river and neighbouring waters. One salmon was taken in Union passage, Grenville channel, 50 miles south of the Skeena.

The table shows that Haystack island is a meeting point from which the salmon sort themselves out for different spawning grounds. The netting season for sockeye ended on August 21, at which time the catch of all kinds of salmon had greatly declined. There seems no doubt that the close of the netting operations militated against a higher return of tagged fish.

2. Deepwater Bay, Seymour Narrows, 1925

Between August 7 and 14, there were tagged 519 individuals, obtained in Deepwater bay from purse seines. About half the total number of tagged fish had the olfactory nerves severed before they were liberated, the purpose being to determine whether the olfactory sense organs influenced the fish in selecting certain rivers and tributaries of rivers during the upstream spawning migration.

Of the tagged fish, 107 (20 per cent) were recaptured, 106 taken in British Columbia and 1 in United States waters. Of the 256 normal fish, 65 (24 per cent) were recaptured, and of the 259 operated fishes, 42 (16 per cent) were retaken.

Locality	Normal fishes	Operated fishes
Lower Fraser river.....	53	18
Birkenhead river.....	2	1
Hell's Gate, Fraser river.....	1	.....
Point Grey.....	3	4
Whidbey island, Wash.....	.....	1
Agememnon channel.....	1	.....
Deepwater bay.....	3	14
Toba inlet.....	1	2
Ramsay arm.....	1	1
Phillip's arm.....	.....	1
Total.....	65	42

The great majority of the returned fish, viz., 75, were taken in the Fraser river, and it is justifiable to conclude that of the Sockeye in Deepwater bay, a considerable percentage were on their way to that river. The results from the operated individuals are not clear. A good percentage (45 per cent) were retaken in the Fraser river or its tributaries, but at the same time 33½ per cent were recaptured in the same area in which they were tagged.

3. Fraser River, 1928

During the summer of 1928 a tagging experiment was undertaken on the Fraser river, the purpose being to ascertain, by tagging daily in the lower river a representative number of Sockeye throughout the run, whether the fish bound

for the spawning beds of the various tributary streams enter and pass up the river at different relative times during the season or whether the distribution is more or less uniform throughout the period of the runs.

The fish were obtained from the traps at Point Roberts and the results of the experiment were:—

Location of Tagging	Number tagged	Number recaptured
Mouth of river.....	57	11
Two miles above Ewen's cannery.....	20	5
2-3 miles above New Westminster bridge.....	64	7
Hammond.....	25	3
Mount Lehman.....	141	18
Matsqui.....	95	12
	402	56

The distribution of recaptured fishes was:—

Point Roberts.....	1
English bay, Vancouver.....	1
Mouth of Fraser river.....	8
Below New Westminster.....	21
New Westminster to Agassiz.....	19
Birkenhead river.....	6
	56

The returns indicate a general disinclination on the part of the fish to continue upstream from the point of their release. Of the 23 returns from fish tagged below or within 2 or 3 miles above the New Westminster bridge, 12 show no marked movement; 5 went upstream, 4 downstream, and 2 tagged at the mouth of the river moved away from the river; 33 returns from fish released above this point show 6 fish taken close to the point of tagging, 20 taken downstream and 7 reported from higher upstream.

The conclusions derived from the experiment, while adding little to the knowledge of the periods during which the various "races" of sockeye bound to the several spawning grounds of the Fraser river enter the river, are, nevertheless, of importance. They show:—

1. That the fish normally transfer from salt water to fresh in a gradual and rather leisurely manner.

2. That any attempt to hasten this transfer is, in general, likely to be unsuccessful, the fish tending either to return towards the sea or remaining where liberated for some time before proceeding upstream.

3. That the normal rate of movement upstream is slow, the average being probably in the vicinity of four miles a day.

THE TAGGING OF PINK SALMON, 1928

A summary of the results of tagging pink salmon in August, September and October, 1928, is given herewith.

During these months 207 individuals were tagged in the region of Discovery passage, Johnston and Broughton straits, from Bate's passage to Robson's bight. Of this number, twenty-two or 10.6 per cent were recaptured as follows:—

Knight inlet.....	1
Ramsay and Phillips arm.....	3
Johnston straits.....	14
Bear river.....	3
Robson's bight.....	1

No recaptures were made in exactly the same locality where tagging took place. This would seem to indicate that the pinks were not tarrying in these

areas but were moving toward spawning rivers. The greatest distance traversed was from Hardy bay to Ramsay arm, about 100 miles. This journey was made at a minimum rate of three miles per day.

Evidence that the fish moved from one place to another in small groups at least, if not in schools, is afforded by the fact that of eighteen tags affixed in Robson's bight twelve were later obtained at Salmon river.

Conclusions

1. The principal migration of pinks in the Johnston and Broughton strait region took place in an east and southerly direction.

2. After they had collected in spawning schools they did not travel far but went chiefly to local streams. This condition was shown to be true for those in Alaskan waters (Gilbert and Rich, 1926).

3. Returns reported seem to indicate that pink salmon taken in Robson's bight are largely made up of fish on their way to Salmon river to spawn.

4. Failure to capture any tagged pinks south of Discovery passage indicates that pinks of Johnstone and Broughton straits did not contribute to Fraser river runs this year (1928).

THE TAGGING OF CHUM SALMON, 1928

The results from tagging of chum salmon in British Columbia waters during 1928 follow in brief form.

Of the 1,031 tags affixed, 148 or 14.4 per cent were returned as listed below.

1. Tagged in Bates passage.	
Returned—	
Sointula cannery.....	1
2. Tagged at Robson's bight (Johnstone straits).	
Returned—	
Squamish, Howe sound.....	1
Point Roberts.....	1
Nanaimo.....	1
3. Tagged in Discovery pass, Chatham point, to Deep water bay.	
Returned—	
Alert bay.....	1
Bute inlet.....	1
Granite bay.....	2
Deep Water bay.....	24
Deep bay, Vancouver island.....	2
Malaspina inlet.....	1
Powell River region.....	2
Comox-Union Bay.....	5
Qualicum.....	30
Nanaimo.....	7
Myrtle point.....	1
Jervis inlet.....	6
Howe sound.....	9
Fraser river.....	48
Puget sound.....	6

The records of three individuals going northward, one to Granite bay, one to Alert bay and one to Bute inlet, are of interest since only three out of all those retaken were caught in localities farther north than where they were tagged.

The relatively large returns from Qualicum and the Fraser river may be somewhat exaggerated due to concentration of the commercial fishery at these points.

The greatest distance travelled was from Deep water bay to Discovery bay, Puget sound, about 170 miles. This was accomplished most quickly of any journey, namely, at a minimum rate of 21 miles per day.

Conclusions:

1. Chums travelled much farther than pinks after they appeared in Johnstone and Broughton straits.

2. They apparently chose two main routes, both of which were southerly, viz., lower mainland and Vancouver island.

3. The mainland run was the larger and went mainly to the Fraser river, although a few did go to the inlets en route and a few southward into American waters.

4. The Vancouver island run went chiefly to Qualicum but several were recaptured at Nanaimo.

SPRING SALMON, CAPTURED AT NORTH ISLAND, QUEEN CHARLOTTE ISLANDS, 1929

Number tagged, 404, Number returned, 51 (12%)

Location of Recapture	Number	Percentage
North island.....	2	3.8
Alaska.....	1	1.9
Skeena.....	4	7.7
Rivers inlet.....	1	1.9
Sooke, B.C.....	2	3.8
Fraser river.....	21	40.4
Puget sound.....	1	1.9
Washington.....	8	15.4
Columbia river.....	10	19.2
Oregon.....	1	1.9

SUMMARY OF PERCENTAGE RETURNS FOR SPRING SALMON

Location of Capture	Year	Location of recapture					
		Fraser river	Puget Sound	Coast of Washington	Columbia river	Coast of Oregon	United States
Ucluelet.....	1925	4.1	11.5	1.6	60.7	1.6	77.0
Ucluelet.....	1926	6.2	17.0	1.7	60.0	.....	78.7
Kyuquot.....	1927	1.4	6.9	8.2	64.4	2.7	82.2
Quatsino.....	.....	.....	29.0	.....	57.0	.....	86.0
Hippa.....	1925	10.8	5.4	5.4	27.0	32.4	70.2
Hippa.....	1929	20.0	17.1	2.8	14.3	20.0	54.2
North island.....	1929	40.4	1.9	15.4	19.2	1.9	38.4

PINK SALMON, SOOKE, B.C., 1929

Number tagged, 185, Number returned 12 (6.5%)

Location of recapture	Number
Sooke.....	1
Fraser river.....	7 (58.0%)
Point Roberts.....	3
Pilchuck creek, Washington, U.S.A.....	1

PINK SALMON, JOHNSTONE STRAITS, 1929

Number tagged, 468, Number returned 33 (7.1%)

Location of recapture	Number
Johnstone straits.....	7
Kingcome inlet.....	1
Loughboro inlet.....	1
Bute inlet.....	1
Deep water bay.....	1
Vancouver island.....	1
Burrard inlet.....	1
Fraser river.....	19 (60%)
Whidbey Island, U.S.A.....	1

COHOES, NORTH COAST OF QUEEN CHARLOTTE ISLANDS, 1929

Number tagged 723, Number returned 26 (3.6%)

Location of recapture	Number	Percentage
North coast.....	4	15.4
Alaska.....	4	15.4
Nass River area.....	3	11.5
Skeena area.....	7	26.9
Gardner Cannery.....	1	3.8
Rivers inlet.....	1	3.8
Burke channel.....	3	11.5
Kingcome inlet.....	1	3.8
Toba inlet.....	1	3.8
Puget sound.....	1	3.8

COHOES, GOOSE ISLANDS AND MILLBANK SOUND, 1929

Number tagged 315, Number returned 22, or 7%

Location of recapture	Number	Percentage
Dean channel.....	3	13.6
Roscoe inlet.....	1	4.5
Burke channel.....	6	27.2
Rivers inlet.....	4	18.2
Belize inlet.....	1	4.5
Seymour inlet.....	1	4.5
Loughboro inlet.....	1	4.5
Toba inlet.....	2	9.1
Johnstone straits.....	2	9.1
Fraser river.....	1	4.5

SPRING SALMON, WEST COAST, QUEEN CHARLOTTE ISLANDS, 1929—COMPARED WITH PERCENTAGE RETURNS OF 1925

Number tagged, 1929, 375. Number returned, 1929, 35 (9%)

Location of recapture	Number	Percentage	
		1929	1925
North island.....	2	5.7	.....
Alaska.....	.....	.....	2.7
Skeena river.....	2	5.7	5.4
Nass river.....	.....	.....	2.7
Barclay sound.....	2	5.7	5.4
Straits of Juan de Fuca.....	3	8.6	2.7
Puget sound.....	6	17.1	5.4
Fraser river.....	7	20.0	10.8
Washington.....	1	2.8	5.7
Columbia river.....	5	14.3	27.0
Oregon.....	7	20.0	32.4

4. *Annual Study of Sockeye Salmon Runs.*—Dr. and Mrs. W. A. Clemens studied the collection of sockeye salmon scales and data of 1929 collected by the Provincial Fisheries Department from the Nass, Skeena and Fraser rivers and from Rivers inlet. This series of annual reports constitutes one of the most comprehensive and continuous records of any fishery.

5. *Pilchard-Herring Investigations*.—Under the joint auspices of the Provincial Department of Fisheries and the Biological Board, Mr. J. L. Hart has commenced a comprehensive study of the pilchards and herring along the following lines:—

- (a) Practically complete statistics of the catches of pilchards from the beginning of the fishery have been obtained from the companies and the basis established for determining the relationship of catch per unit of effort.
- (b) Basis established for the sampling of catches.
- (c) Basis established for the annual statistical analyses of the catches with regard to length and weight.
- (d) System being developed for the accurate annual record of the spawning of herring in all important areas.
- (e) Program being developed for the study of the life histories in relation particularly to hydrographic and food factors.
- (f) Plans for the investigation of the alleged pollution of herring spawning areas by reduction plants.

The study of the distribution and abundance of the food organisms of the pilchard, commenced by Dr. H. C. Williamson, is being completed.

During the month of March, Mr. J. A. Munro, Chief Federal Migratory Bird Officer for the Western Provinces, continued his study of the relation of gulls and ducks to the spawning of herring in the Departure Bay region. His report is now completed and ready for publication.

6. *Shellfish*

(a) *Oysters*.—While no studies were carried out in British Columbia waters this year, Mr. C. R. Elsey spent two months at Willapa harbour, Washington, in association with Prof. T. Kincaid. The experience gained will be extremely valuable. The appointment of Mr. Elsey as full-time investigator will assure important progress in the investigations.

It is planned during the coming year to carry out extensive studies along the following lines:—

- (1) To study intensively the life histories of the native oyster, the introduced eastern oyster and the introduced Japanese oyster.
- (2) To attempt to establish the Japanese oyster in areas where the native and eastern oyster do not appear to thrive.
- (3) To investigate the conditions under which the eastern oyster spawns and spats in British Columbia waters.
- (4) To study the possibility of improving the methods of production of all three species.

Special attention will be given to the Boundary Bay and Ladysmith Harbour areas.

(b) *Shrimps*.—Miss A. Berkeley continued her studies of the life histories of the commercial shrimps of British Columbia. The discovery that shrimps are all males for the first two years of their lives and then change to females is of particular interest.

(c) *Clams*.—Dr. C. M. Fraser is completing a report on the razor clams of the Queen Charlotte islands.

7. *The Trout of British Columbia*.—Mr. C. McC. Mottley spent three months investigating the Kamloops trout in the Okanagan district. Prof. J. R. Dymond and Mr. Mottley will shortly issue a popular illustrated account of the trout of British Columbia, a technical report on racial studies, and a special report on the Kamloops trout.

8. *Ling Cod*.—Mr. G. V. Wilby has carried out a study of the life history of the ling cod, covering its spawning habits, development, rate of growth, food, etc., and of the statistics of the catches in various areas.

9. *Fish Parasites*.—(a) The external parasites of the fish of the strait of Georgia have been studied by Miss Ruby Bere and a detailed report is practically ready for publication.

(b) The internal parasites of fish, especially of salmon, are being studied by Prof. R. A. Wardle.

10. *Oceanography*.—Dr. A. H. Hutchinson, Mr. C. C. Lucas, Mr. M. MacPhail and Miss Campbell continued their studies of the physico-chemical conditions and of the plankton in the strait of Georgia, extending the area of the investigation chiefly to the northward as far as Johnstons strait and Bute inlet. Special attention has been given to the inflow of fresh water and its relation to the development and distribution of the plankton. The distribution, fate and influence of the Fraser river water has been studied in detail.

The oceanographical data collected by Dr. H. C. Williamson on the west coast of Vancouver island during the past several years is being assembled.

11. *Faunal Studies*.—The systematic study of the fauna of our waters was carried forward by Mrs. C. Berkeley on polychaet worms, by Miss J. F. L. Hart on Cumacea, by Miss V. Z. Lucas on Ostracoda, by Miss M. H. Campbell on Copepoda, by Prof. J. R. Dymond on marine and freshwater fish, by Mr. G. H. Wailes on Protozoa and diatoms.

12. *Biochemical and Physiological Researches*.—(a) Mr. C. Berkeley has worked out an interesting symbiotic relationship existing between a polychaet worm and a flagellate.

(b) Miss M. Crawford investigated the utilization of silica by marine diatoms. It was expected that the results of this study would have a bearing upon the problem of silicosis.

EDUCATION

A two-weeks' course of instruction was given at the University of British Columbia to the superintendents of hatcheries of the province. The instructors were Dr. R. E. Foerster in fish culture and fish diseases, Mr. D. B. Finn in physics and chemistry, and Dr. W. A. Clemens in fish anatomy and physiology and the identification and life histories of the fresh water fishes of British Columbia.

CONFERENCE

The annual conference of the scientific staff and investigators of the board was held during the first week of September at the Nanaimo Station. Twenty-three investigators were in attendance and fifteen reports on investigations were presented. Dr. C. M. Fraser gave an evening address on his visits to various biological stations of the world.

INTERNATIONAL PACIFIC SALMON FEDERATION

A meeting of the Federation was held in April in Vancouver, where the Biological Board was represented by Dr. R. E. Foerster, Mr. A. L. Pritchard, and Dr. W. A. Clemens. Reviews of the salmon investigations being carried out by the Biological Board were presented.

CANADIAN FISHERIES ASSOCIATION

At the convention of the association, held in August in Prince Rupert, Dr. W. A. Clemens gave a summary of the work of the Pacific Biological Station. The eastern delegates later visited the station.

RECENT PUBLICATIONS FROM STATION

Some twenty-six publications based upon work done at the station have appeared during the past year. These are as follows:—

- Berkeley, A.—The Commercial Shrimps of British Columbia. Museum Notes, Vancouver, Oct., 1929.
- Berkeley, Edith.—Polychaetous Annelids from the Nanaimo District. *Contrib. Can. Biol. and Fish.*, 1929.
- Campbell, M. B.—Preliminary Quantitative Study of the Zooplankton in the Strait of Georgia. *Trans. Royal Soc. Can.*, 1929.
- Clemens, W. A. and Clemens, L. S.—Contributions to the Life History of the Sockeye Salmon (Paper No. 14) B.C. Fisheries Department, 1929.
- Clemens, W. A.—Investigations on the Pacific Salmon. *Proc. Third Pan-Pacific Congress, Japan*, 1926.
- Clemens, W. A.—Suggestions as to the Standardization of Plankton Methods. *Proc. Third Pan-Pacific Science Congress, Japan*, 1926.
- Dymond, J. R.—The Trout of British Columbia. *Trans. Amer. Fish. Soc.*, 1929.
- Foerster, R. E.—An Investigation of the Life History and Propagation of the Sockeye Salmon at Cultus Lake, B.C. No. 1, Introduction and the Run of 1925. *Contrib. Can. Biol. and Fish.*, 1929. No. 2, The Run of 1926. *Contrib. Can. Biol. and Fish.*, 1929. No. 3, The downstream migration of the young in 1926 and 1927. *Contrib. Can. Biol. and Fish.*, 1929.
- Foerster, R. E.—Notes on the Relation of Temperature, Hydrogen-Ion Concentration and Oxygen to the Migration of Adult Sockeye Salmon. *Can. Field. Nat.*, Vol. XLIII, 1929.
- Foerster, R. E.—Propagation's Part in the Conservation of Sockeye Salmon. *Trans. Amer. Fish. Soc.*, 1929.
- Fraser, C. M.—Marine Wood Borers of the Pacific Coast of North America. *Proc. Third Pan-Pacific Science Congress, Japan*, 1926.
- Fraser, C. M.—International Co-operation in the Investigation of Pelagic Fish Eggs and Larvae. *Proc. Third Pan-Pacific Science Congress, Japan*, 1926.
- Fraser, C. M.—Rational Methods for the Protection of Useful Aquatic Animals and Plants of the Pacific. *Proc. Third Pan-Pacific Science Congress, Japan*, 1926.
- Hunter, Andrew.—Further Observations on the Distribution of arginase in Fish. *Jour. Biol. Chem.*, March, 1929.
- Hunter, Andrew.—The Creatine Content of the Muscles and some other tissues in Fishes. *Journ. Biol. Chem.*, March, 1929.
- Hutchinson, A. H., Lucas, C. C. and MacPhail, M.—Seasonal Variations in the Chemical and Physical Properties of the Waters of the Strait of Georgia in Relation to Phytoplankton. *Trans. Royal Soc. Can.*, Vol. XXIII, 1929.
- Lucas, C. C.—Further Oceanographical Studies of the Sea adjacent to the Fraser River mouth. *Trans. Royal Soc. Can.*, Jan., 1929.
- Lucas, C. C. and King, E. J.—Use of Picric Acid as an Artificial Standard in the Colorimetric Estimation of Silica. *Jour. Amer. Chem. Soc.*, 1928.
- Mottley, C. McC.—Report on the Study of the Scales of Spring Salmon tagged in 1926 and 1927 off the West Coast of Vancouver Island. *Contrib. Can. Biol. and Fish.*, 1929.
- Quigley, J. P.—Observations on the Life History and Physiological Condition of the Pacific Dogfish. *Biol. Bull.*, Dec., 1928.
- Simpson, W. W.—Relation of the Liver to Asphyxial Hyperglycaemia in Fishes. *Quart. Journ. Exp. Physiology*, Vol. XLX, 1928.
- Wailes, G. H.—Plant Life in the Open Sea. Museum Notes, Vancouver, March, 1929.
- Wailes, G. H.—Marine Ciliates of the Genus *Laboea* from British Columbia. *Ann Protistologie*, 1929.
- White, F. D.—Studies on Marine Wood Borers. *Contrib. Can. Biol. and Fish.*, 1929.
- White, F. D.—Reducing Substances in the Blood of the Dogfish. *Journ. Biol. Chem.*, 1928.
- Williamson, H. C.—Report on the Tagging Operations in 1926. *Contrib. Can. Biol. and Fish.*, 1929.

FISHERIES EXPERIMENTAL STATION (PACIFIC) PRINCE RUPERT, B.C.

STAFF

Director, Mr. D. B. Finn.
 Biochemist (on leave), Dr. T. Ingvaldsen.
 Organic Chemist, Mr. H. N. Brocklesby.
 Bacteriologist, Mr. R. H. Bedford.
 Mechanical Engineer, Mr. O. C. Young.
 Assistant Chemist, Mr. L. F. Smith.
 Assistant Chemist, Mr. O. F. Denstedt.
 Laboratory Assistant, Mr. Bruce Stevens.
 Secretary, Miss R. Gillies.
 Factor, Mr. H. Richmond.

Summer Workers, 1929

Bacteriologist, Prof. W. Sadler.
 Assoc. Bacteriologist, Mr. D. C. B. Duff.
 Scientific Assistant, Mr. P. Black.

BUILDINGS

The existing building has undergone but slight modification, the principal changes being in the installation of a bacteriological laboratory on the ground floor.

Plans and specifications for building No. 2, have been drawn up and approved. Contracts have been let for the construction of the building with the exterior complete but with only the basement finished inside, the ground and second floors being left for completion of the interiors at a later date. A low temperature research laboratory is being constructed in the basement. The building contract will be complete on May 31, 1930.

EQUIPMENT

The station now possesses well equipped biochemical, chemical and bacteriological laboratories. It also has a small nutrition laboratory which is in need of extension in view of the work which should be undertaken upon fish meals and other edible marine products.

INVESTIGATIONS

The investigations of this station are at present carried on under two main divisions: I. Preservation, which may include all investigations having to do with the processing or marketing of fish and other marine products. II. By-products, under which are grouped those studies which deal with the utilization of waste materials or of marine products which are not used primarily as food for human consumption.

Preservation

Discolouration of Halibut.—Following the work of Harrison and Sadler who traced the discolouration of halibut in the holds of fishing vessels to a specific bacteria, experiments were conducted with appropriate germicides which would kill the causative organism but without injuring the quality of the fish.

In his connection there are two factors of equal importance in disinfection to be considered:—

- I. That of the water for ice making,
- II. The holds of the vessels.

Two efficient germicides were considered: (1) Chlorine and its compounds, (2) Formaldehyde. The former was eliminated from serious consideration owing to (1) cost of installation for water sterilization, (2) possible harmful effect upon fish, (3) damage to vessel and gear.

Formaldehyde combines germicidal and preservative properties. It has proved effective in the sterilization of ice and in killing large numbers of micro-organisms in the presence of considerable quantities of fish slime (28% organic matter). The concentrations required for this are of economic significance, 0.005% being required for the former and 2% for the latter.

The practical applications of laboratory findings indicate that the control of discolouration by methods which involve the complete sterilization of the ice and vessels is impracticable.

New methods for control of the organism are being developed. It is hoped that the elimination of discolouration may be brought about, not by elimination of the bacteria, but by producing conditions within the vessel and on the surface of the fish which will inhibit its growth.

REFRIGERATION

A low temperature research laboratory has been designed and is being constructed in the basement of the new building. Its equipment will include storage rooms of controlled temperature having a temperature range from -20° F. upwards. Its freezing equipment will permit the use of temperatures from -40° F. to 32° F. The laboratory will be provided with automatic temperature control and its thermometric system will include both resistance thermometer and thermocouples.

The chemical researches on the storage of frozen fish which have been initiated will be carried forward with these new facilities. A series of engineering studies upon cold storage practice will also be made. These will include the erection of a demonstration "Jacketed Cold Storage Room" which has been developed at Halifax.

The investigations will include:—

- (I) An Examination of the Chemical and Physical Changes which Occur in Fish During Cold Storage.
- (II) A Chemical Study of "Rusting".
- (III) A Study of Methods for Cooling Cold Storage Rooms.

SALMON SPOILAGE

With a view to improving the quality of salmon as they are landed at the canneries, a bacteriological investigation of salmon spoilage has been undertaken. This investigation includes a study of various methods of storage in fishing vessels. A preliminary study of the bacterial flora of salmon before its contamination has been made. The work will be continued during the coming year. A preliminary report entitled "The Bacterial Spoilage of Salmon with Reference to the Source of the Organisms Responsible for Putrefaction" has been issued.

By-Products

Fish Oils.—The production of fish oils on the Pacific coast has risen from 500,000 gallons in 1926 to 4,000,000 gallons in 1928 for which the increased production of pilchard oil has been mainly responsible. Its highly unsaturated character makes possible its use in certain types of paint. However in its natural state, it possesses certain chemical characteristics which make it undesirable for this purpose. Very little is known of its chemical constitution or of the effect which various methods of manufacture may have upon its composi-

tion. With a view to correcting its defects as a paint oil, the station has undertaken an examination of its chemical and physical properties. In addition to these detailed studies of methods for its preparation are being conducted.

During the course of experiments dealing with the bodying of pilchard oil with various catalysts it has been found that while the water resisting properties, the flexibility and the drying times are satisfactory, the paint film is somewhat softer than that produced by linseed oil. Further investigation is necessary before this defect can be overcome. The research includes:—

I. The preparation of Pilchard Oil for use in Paints,

(a) The Bodying of Pilchard oil by Catalysts.

(b) The Study of Paint films prepared from Pilchard Oil.

II. The Chemical Constitution of Pilchard Oil,

(a) The Unsaturated Fatty Acids.

(b) The Polymerization of the Unsaturated Esters in Pilchard Oil.

Glues.—Various methods for the production of glues from the waste liquors of fish meal plants have been examined. From these methods those have been selected which will give a satisfactory glue from the point of view of strength tests and at the same time most nearly approach existing methods of fish meal manufacture. Large samples have been prepared in an industrial fish meal plant. These samples are now being examined in order to determine the limits of impurities which can be tolerated. These data will be used to determine the extent of factory modification necessary for the production of fish glues.

The study includes:—

I. The Effect of the Salt content upon the Physical Properties of Fish Glues.

II. The Preparation of Fish Glues in Commercial Meal Factories.

Part of this investigation is being conducted in co-operation with the Forest Products Laboratory, Vancouver, B.C.

The Nutritive Value of Marine Products.—Together with the increased production of fish oils there has been a similar increase in the production of fish meal. These meals are being used as stock and poultry feeds. Since Pacific coast fish meals are made from oil containing fish and often contain appreciable quantities of unsaturated oils there have arisen many problems with regard to the proper use of these substances as feed stuffs. It has been found that methods of fish meal manufacture have a distinct bearing upon its nutritive value. Researches are in progress which have as their purpose the development of methods for the production of fish meal at its optimum value in nutrition. The problem of deterioration of the product on storage is also being looked into.

A survey of the vitamine content of fish oils has also been undertaken. An assay for vitamines A. and D. has been made on the liver oil of the Dogfish (*Squalus sucklii*). The vitamine D. content of pilchard oil has been reported and a vitamine A assay on the same oil is in progress.

The researches are being conducted as follows:—

(1) The Effect of the Oil Content of Pilchard Meal upon its Digestibility and its Biological Value.

(2) The Influence of Fish Meals on Growth.

(3) The Vitamine A content of Pilchard Oil.

(4) The Effect of Ingested Fish Oils upon the Nature of the Body Fat.

(5) The Effect of Storage upon the Nutritive Value of Fish Meals.

A LIST OF PUBLICATIONS FROM THE FISHERIES EXPERIMENTAL STATION (PACIFIC)

Determination of Vitamine A Content in the Liver Oil of the Dogfish (*Squalus sucklii*). H. N. Brocklesby, Can. Chem. & Met. XI, 238; 1927.

Vitamine D. Content of the Liver Oil of the Dogfish (*Squalus sucklii*). H. N. Brocklesby, Can. Chem. & Met. XIII, 74, 1929.

Fish Meals I. The Effect of the High Temperatures employed for drying upon the nitrogen partition in Fish Meals, T. Ingvaldsen, Can. Chem. & Met. XIII, 97, 1929.

Fish Meals II. Comparative Analysis of Meals from Non-Putrid and Putrid Materials. T. Ingvaldsen, Can. Chem. & Met. XIII, 129, 1929.

Studies in Fish Oil. Some properties of commercial pilchard oil. H. N. Brocklesby, Can. Chem. & Met. XIII, 212, 1929.

Discoloration of Halibut, F. C. Harrison, Can. Journal of Research, 1, 201, 1929.

Discoloration of Halibut, F. C. Harrison and W. Sadler, Biological Board of Canada. Bulletin XII, 1929.

The Nutritive Value of Marine Products, Vitamine D Content of Pilchard Oil, H. N. Brocklesby. (In Press.)

Manuscript Reports

The Determination of the Vitamine A. Content of the Liver Oil of the Dogfish (*Squalus sucklii*). H. N. Brocklesby, 1927.

The Determination of the Vitamine D. Content of the Liver Oil of the Dogfish (*Squalus sucklii*). H. N. Brocklesby, 1928.

An Investigation of the Circulation Induced by High Velocity Jets in Rectangular Tanks of Water, I. M. Fraser, 1928.

A Chemical Study of the Oil in Salmon During Cold Storage. H. N. Brocklesby, 1929.

The Bacterial Spoilage of Salmon with reference to the Source of the Organism Responsible for Putrefaction. D. C. B. Duff, 1929.

APPENDIX No. 3

FISH CULTURE

ANNUAL REPORT BY J. A. RODD, *Director*

Operations of the department during the calendar year 1929 were devoted to the propagation of the more important freshwater and anadromous food and game fishes, including Atlantic and landlocked salmon, speckled, brown, Loch Leven, and rainbow trout in the Maritime Provinces, whitefish, pickerel, cutthroat, rainbow, brown and Loch Leven trout in the Prairie Provinces, and Pacific salmon (principally sockeye), cutthroat, Kamloops, rainbow, and speckled trout in British Columbia.

Existing facilities for retaining and feeding fry so as to afford a longer season for distribution were enlarged at several establishments where such development was feasible. The total distribution for 1929 was over twenty-one per cent larger than it was in 1928, and almost twice as large as the distribution for 1927. The distribution for these years was:—

1927..	295,283,782
1928..	470,302,380
1929..	570,771,626

Increases over 1928 in numbers distributed were made in rainbow, cutthroat, speckled and Kamloops trout, sockeye and spring salmon, and whitefish. The bulk of the increase was, however, in whitefish fry distributed in the Prairie Provinces, which was increased from 129,183,026 in 1928 to 216,755,000 in 1929.

The numbers of each species distributed were:—

STATEMENT, BY SPECIES, OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1929

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings	Yearlings and older	Total distribution
<i>Salmo salar</i> —Atlantic salmon...	1,350	200	2,670,752	1,698,000	13,032,684		17,402,986
<i>Salmo salar sebago</i> —Landlocked salmon.....				94,713		18	94,713
<i>Salmo irideus</i> —Rainbow trout.....		315,215	467,061	404,450	509,372		1,696,116
<i>Salmo clarkii</i> —Cutthroat trout.....		240,060	1,259,869	799,500	149,080		2,448,509
<i>Salmo gairdneri</i> —Steelhead salmon.....		35,000	62,892		78,652		176,544
<i>Salmo gairdneri kamloops</i> —Kamloops trout.....	130,000	2,010,500	1,263,756				3,404,256
<i>Salmo trutta leucomaenis</i> —Loch Leven trout.....				120,000	386,100	12	506,112
<i>Salmo fario</i> —Brown trout.....					144,312	911	145,223
<i>Oncorhynchus nerka</i> —Sockeye salmon.....	505,000	35,868,310	47,326,224	50,000	13,164,571		96,914,105
<i>Oncorhynchus tshawytscha</i> —Spring salmon.....		275,000	1,041,410		218,870		1,535,280
<i>Oncorhynchus kennerlyi</i> —Kennerly's salmon.....		264,000					264,000
<i>Salvelinus fontinalis</i> —Speckled trout.....		235,000	781,748	246,100	8,177,170	2,291	9,442,309
<i>Coregonus clupeaformis</i> —Whitefish.....	44,125,000		172,630,000				216,755,000
<i>Cristiomer namaycush</i> —Salmon trout.....				49,000	200,728		249,728
<i>Stizostedion vitreum</i> —Pickerel..	108,035,000	170,000	111,047,500				219,252,500
	152,796,350	39,413,285	338,551,212	3,461,763	36,061,539	3,232	570,287,381 (a)

(a) This distribution represents output 1929 resulting from autumn spawners of 1928 and from spring spawners of 1929.

In addition to the above 484,245 cutthroat trout eyed eggs were purchased from S. S. Drew, Esq., Troy, Montana, and planted direct as follows:—

Fraser River watershed—

Sumas river.....	25,000
Kanaka creek.....	25,000
Nicomekl river.....	434,245
	<hr/> 484,245

In addition to the distributions that were made from the hatcheries, twenty-eight lakes and streams received allotments of fingerlings and older fish by transfer from other bodies of water. This work was very largely confined to the Prairie Provinces where there are many districts which are not readily accessible to existing hatcheries and which have many bodies of water of indifferent quality, in which the better class of fishes, such as are handled in our hatcheries, are not likely to live and thrive. This work involved the capture and transfer, in many instances, for considerable distances of 18,274 fish.

It will be observed from the following statement that the transfers made during 1929 consisted very largely of yellow perch, which are giving good returns in many waters that were barren previous to the introduction of this species.

STATEMENT SHOWING THE TRANSFERS OF FISH FROM ONE BODY OF WATER TO ANOTHER DURING 1929

Waters stocked		Transferred from	Stage	Crayfish	Minnows	Perch	Pickrel	Total
Little Saskatchewan river at Brandon, Man.		Echo lake...	2 yr. olds...			1,000		1,000
Anderson lake, Sask. N.E. of S. 1 and SE. of S. 12 T. 45, R. 12, W. 2.		Stony lake...	Fingerlings...			400	150	550
Bear lake, Sask., S. 17, 18, 20, T. 44, R. 24, W. 2.		Wakaw lake...	Mature...			175		175
Deep lake, Sask., S. 32, 33 T. 26 R., 28 W. 3.		Echo lake...	Fingerlings...			175		175
Dixon lake, Sask., T. 44, 45, R. 23, 24, W. 2.		Wakaw lake...	Mature...			200		200
Echo lake, Sask., S. 19, 24, T. 40, R. 14, W. 2.		Stony lake...	Fingerlings...			75		75
Gordon's lake, Sask., S. 33 T. 42, R. 28, W. 3.		Dilberry lake...	Fingerlings...			300		300
Harwood's pond, Sask., S. 1, T. 15, R. 28, W. 2.		Echo lake...	Fry...			106		106
Lightfoot's lake, Sask., S. 33, T. 15, R. 28, W. 2.		"	Mature...			200		200
Martin's lake, Sask., S. 33, T. 16 and S. 34, T. 47, R. 7, W. 3.		"	Mature...			100		100
Moose Jaw River, C.P.R. dam at Whitestone, Sask.		Irquois lake...	Fry...			200		200
Pan Cake lake, Sask., S. 31, T. 50, R. 15, W. 3.		Echo lake...	2 yr. olds...			1,300		1,300
Lake near Primato, Sask., S.W. 1 of S. 23, T. 36, R. 28, W. 3.		Murray lake...	Advanced fry...			800		800
Rolle Pond, Sask. N.W. 27, T. 41, R. 12, W. 3.		Dilberry lake...	Fingerlings...			1,000		1,000
Souris river, C.P.R. dam at Weyburn, Sask.		Murray lake...	Fry...			400	150	550
Antoine lake, Alta. (or Little Egg lake), S. 32 and 4, 5, 7, 8, T. 66, 67, R. 14, W. 4.		Echo lake...	Advanced fry...			175		175
" " " " " "		Beaver lake...	Mature...			400		400
" " " " " "		"	2 yr. olds...			400	300	700
Chain lake, Alta.—		Lac la Biche...	1-2"...			150		150
Rooke lake, S. 12, 13, T. 42, R. 25, W. 4.		"	3-4"...			450		450
Hutchcroft lake, S. 6, 7, T. 43, R. 24, W. 4.		Pine lake...	Yearlings...			1,834		1,834
Chestermore lake, Alta., S. 23, T. 24, R. 28, W. 4.		"	Yearlings...			1,566		1,566
Clark's lake, Alta., S. 2, T. 40, R. 27, W. 4.		"	Yearlings...			1,675		1,675
Elkwater lake, Alta., S. 22-26, T. 8, R. 2, W. 4.		Echo lake...	Mature...			20		20
Gull lake, Alta., T. 41, 42, R. 28, W. 4.		"	500					
Lake No. 3, N.E. 1 of S. 13, T. 53, R. 2, W. 5, Alta.		Pine lake...	Mature...			100		100
McAllister lake, Alta., S. 4, T. 24, R. 25, W. 4.		"	Yearlings...			2,400		2,400
Mooschills lake, Alta., S. 10, 11, 15, 21, 22, T. 57, R. 6, W. 4.		Maystan lake...	Mature...			40		40
Kelowna waters, B.C.—		Pine lake...	5-8"...			60		60
Golf links pond at Kelowna...		Whitney lake...	Yearlings...			1,125		1,125
Two deep ponds at Kelowna (100 each)		"	Mature...			48		48
Indian school pond, at Kamloops		Sulphur waters...			220			220
		Adjacent to cave.			200			200
		And basin at Banff.			80			80
				500	500	16,674	600	18,274

The seeding, with eyed eggs, of isolated waters, to which it is not feasible to transfer fry from existing hatcheries, was continued in British Columbia, 16,939,000 sockeye eggs collected in the fall of 1928 below Hell's Gate were planted out from Cultus, Harrison and Pemberton hatcheries early in 1929 in an eyed condition above Hell's Gate as follow: Shuswap Lakes district: Eagle river 16,037,000; Salmon river, 602,000; Anderson-Seton lakes, 300,000.

The whitefish hatching battery on the C.G.S. *Bradbury* was again utilized at the egg collecting camp on Dauphin river, lake Winnipeg, in handling the eggs there as they were collected and until they could be transferred and placed in the hatchery at Gull Harbour. This battery was also utilized for distribution purposes, and 24,525,000 whitefish fry from the Gull Harbour hatchery in the southerly portion of lake Winnipeg were distributed, as they hatched, much farther north and over a more extensive area than would have been otherwise feasible.

Fish cultural officers are annually becoming more familiar with their respective distribution areas, and are endeavouring to seed them to the best advantage with crops of fry and older fish, that are annually available for that purpose, so as to obtain best results in mature fish. In addition to inspections by fish cultural officers, a considerable number of lakes and streams were also examined and reported on by the supervisors of fisheries and fishery officers, particularly in the Prairie Provinces. Copies of all reports of this nature are supplied in duplicate to the Chairman of the Research Committee on Fish Culture of the Biological Board for the information of the committee's workers in the respective districts. Inspections and investigations of a special nature are also referred to the committee of the board on fish culture as occasion arises. Several important inspections were made and detailed reports submitted by the district supervisors of fish culture with regard to the introduction of non-indigenous species, the location of egg-collecting camps and hatchery sites.

Prospecting camps were operated at several points for the purpose of determining the possibilities for collecting eggs for fish cultural purposes, and much data was obtained. Such camps operated last year were continued from the Margaree hatchery in the Pleasant Bay area, Cape Breton island; from the Banff hatchery in Cold lake, Alberta; and at Penask lake, British Columbia. A new camp, which gave promising returns for the initial season, was opened at Lochaber lake, Nova Scotia, in connection with the new hatchery that was established the previous autumn at South River, Antigonish county, Nova Scotia.

A considerable amount of work was carried out in the matter of investigating possible hatchery sites in the Windsor and Sydney areas. A large number of lakes in Nova Scotia were examined with a view to discovering waters suitable for stocking with rainbow trout. This work was chiefly confined to Cape Breton and Yarmouth areas.

Further examinations were made in an endeavour to discover good sites for salmon ponds, taking into consideration the necessity of having such sites in close proximity to an adequate supply of parent salmon and good transportation facilities. Some of these sites were inspected and surveys in this connection were made on the northwest Miramichi river, New Brunswick, Morell river, Prince Edward Island, and Margaree river, Nova Scotia.

One new trout hatchery was constructed this year at Penask lake, British Columbia, as described later in this report.

At the close of 1929 there were thirty main hatcheries, ten subsidiary hatcheries, five salmon retaining ponds and several egg-collecting stations. The output from these establishments during 1929 was as follows:—

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH
DURING 1929

Nova Scotia—		
Atlantic salmon.....	6,596,855	
Speckled trout.....	5,466,112	
		12,062,967
New Brunswick—		
Atlantic salmon.....	10,498,004	
Brown trout.....	101,423	
Landlocked salmon.....	94,713	
Loch Leven trout.....	40,398	
Rainbow trout.....	318	
Speckled trout.....	2,459,050	
		13,193,906
Prince Edward island—		
Atlantic salmon.....	308,127	
Rainbow trout.....	25,372	
Speckled trout.....	682,354	
		1,015,853
Manitoba—		
Pickarel.....	145,375,000	
Salmon trout.....	109,500	
Whitefish.....	141,000,000	
		286,484,500
Saskatchewan—		
Loch Leven trout.....	133,714	
Pickarel.....	54,057,500	
Salmon trout.....	91,228	
Whitefish.....	60,720,000	
		115,002,442
Alberta—		
Brown trout.....	43,800	
Cutthroat trout.....	2,236,185	
Loch Leven trout.....	332,000	
Pickarel.....	19,820,000	
Rainbow trout.....	1,209,837	
Salmon trout.....	49,000	
Speckled trout.....	208,786	
Whitefish.....	10,355,000	
		34,254,608
British Columbia—		
Cutthroat trout.....	212,324	
Kamloops trout.....	3,404,256	
Kennerly's salmon.....	264,000	
Rainbow trout.....	460,589	
Sockeye salmon.....	96,914,105	
Speckled trout.....	626,007	
Spring salmon.....	1,535,280	
Steelhead salmon.....	176,544	
Whitefish.....	4,680,000	
		108,273,105
		(a) 570,287,381

(a) This distribution represents output 1929 resulting from autumn spawners of 1928 and from spring spawners of 1929.

In addition to the above, 484,245 cutthroat trout eyed eggs were purchased from S. S. Drew, Troy, Montana, and planted direct as follows:—

Fraser River watershed—	
Sumas river.....	25,000
Kanaka creek.....	25,000
Nicomekl river.....	434,245
	484,245

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING THE SEASON 1929

Established	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger-lings	Yearlings and older fish	Total distribution by species	Total distribution by hatcheries
1929	Antigonish.....	Antigonish county, N.S.	Atlantic salmon.....				550,000	485,780		1,035,780	
1876	Bedford.....	Halifax county, N.S.	Speckled trout.....					1,054,055		1,054,055	2,089,835
1902	Margaree.....	Inverness county, N.S.	Atlantic salmon.....	(b) 1,350	200			1,159,950		1,161,500	
1912	(a) Lindolf.....	Richmond county, N.S.	Speckled trout.....			230		1,377,000		1,377,230	2,558,730
1913	Middleton.....	Annapolis county, N.S.	Atlantic salmon.....				910,000	1,045,000		1,955,000	
1906	Windsor.....	Hants county, N.S.	Atlantic trout.....			297,600		189,822		189,822	2,144,822
1929	Yarmouth.....	Yarmouth county, N.S.	Speckled trout.....					1,007,000		297,600	2,97,600
1928	Florenville.....	Atlantic salmon.....	N. distribution.....					1,367,530		1,367,530	2,374,530
1880	Grand Falls.....	Carleton county, N.B.	Speckled trout.....			25,000		1,139,975		1,139,975	
1915	(a) Tobique.....	Victoria county, N.B.	Atlantic salmon.....				30,000	1,422,475		1,477,475	2,617,450
1914	St. John.....	St. John county, N.B.	Atlantic trout.....				15,000	1,516,624		1,516,624	
			Atlantic salmon.....					723,686	1,316	740,002	2,256,626
			Speckled trout.....					2,026,287		2,026,287	
			Atlantic salmon.....			488,000	107,500	690,074		797,574	2,823,861
			Atlantic trout.....					488,000		488,000	488,000
			Brook trout.....					283,866		433,866	
			Landlocked salmon.....					100,512	911	101,423	
			Loch Leven trout.....				94,713	15,386		94,713	
			Rainbow trout.....		300		25,000			40,398	
1874	Miramichi.....	Northumberland county, N.B.	Speckled trout.....				20,000	647,300		668,275	1,338,993
1874	Restigouche.....	Restigouche county, N.B.	Atlantic salmon.....					4,175,089		4,175,089	
1914	(a) Nipisiquit.....	Gloucester county, N.B.	Speckled trout.....			1,380,308		96,474		96,474	4,271,563
1906	Kelly's Pond.....	Queen's county, P.E.I.	Atlantic salmon.....			156,725		97,546		1,477,854	
			Atlantic trout.....			380,284		156,725		156,725	1,634,579
			Rainbow trout.....			124,560	88,000	308,127		308,127	380,284
1914	Gull Harbour.....	Big island, Lake Winnipeg, Man.	Speckled trout.....					95,567		25,372	
1928	Swan Creek.....	Swan creek, lake Manitoba, Man.	Whitefish.....	(b) 1,800,000	170,000	5,225,000		608,754		682,354	1,015,853
1909	Winnipegosis.....	Snake island, lake Winnipegosis, Man.	Pike.....	88,980,000		72,700,000		5,395,000		5,395,000	
			Whitefish.....			56,000,000		74,500,000		74,500,000	79,895,000
1929	(c) Cootlin.....	McIntosh creek, Sask.	Pike.....			66,500,000		139,980,000		139,980,000	139,980,000
1915	Fort Qu'Appelle.....	Fort Qu'Appelle, Sask.	Whitefish.....	24,055,000				109,500		109,500	66,609,500
			Loch Leven trout.....	(b) 42,325,000				24,055,000		24,055,000	
			Pike.....			30,002,500		42,325,000		42,325,000	66,380,000
1914	Banff.....	Banff, Alta.	Salmon trout.....					133,714		133,714	
			Brook trout.....			18,395,000		91,228		91,228	
			Cutthroat trout.....		240,000	135,000	520,000	43,800		43,800	48,622,442
			Pike.....			670,000	95,000	1,042,000		1,042,000	
			Rainbow trout.....			226,000	155,000	237,000		332,000	332,000
			Salmon trout.....				49,000	210,000		210,000	670,000
1917	(a) Spray lakes.....	Spray lakes, Alta.	Outthroat trout.....		60	322,860		591,000		591,000	2,727,800
								49,000		49,000	322,920

1928	(a) Jasper Park.....	Jasper Park, Alta.....	Rainbow trout.....	45,387	45,387	45,387	45,387
1927	Lesser Slave Lake.....	Lesser Slave Lake, Alta.....	Speckled trout.....	208,786	208,786	208,786	254,173
1928	Waterton Lakes.....	Waterton lakes Park, Alta.....	Pickeral.....	19,150,000	19,150,000	19,150,000	29,505,000
1916	Cultus lake.....	Cultus lake, B.C.....	Whitefish.....	10,355,000	10,355,000	10,355,000	1,444,715
1905	(a) Harrison lake.....	Harrison lake, B.C.....	Cutthroat trout.....	591,765	279,500	279,500	4,015,000
1922	(a) Lloyds creek.....	Lloyds creek, Kamloops district, B.C.....	Rainbow trout.....	50,000	249,450	249,450	78,652
1906	Pemberton.....	Pemberton, Kamloops district, B.C.....	Sockeye salmon.....	3,000	78,652	78,652	24,200,000
1917	Pitt lake.....	Pitt lake, B.C.....	Steelhead salmon.....	4,814,000	4,814,000	4,814,000	1,130,100
1908	Stuart lake.....	Stuart lake, B.C.....	Kamloops trout.....	275,100	275,100	275,100	53,400
1929	(c) Squilax Camp.....	Adams river, Shuswap District, B.C.....	Sockeye salmon.....	3,200,000	3,200,000	3,200,000	21,650,000
1903	Lakelse lake.....	Lakelse lake, B.C.....	Kamloops trout.....	125,000	125,000	125,000	5,119,188
1908	Babine lake.....	Babine lake, B.C.....	Sockeye salmon.....	4,069,300	4,069,300	4,069,300	14,150
1906	Rivers Inlet.....	Rivers Inlet, B.C.....	Sockeye salmon.....	5,662,000	5,662,000	5,662,000	3,214,150
1911	Anderson lake.....	Anderson lake, Vancouver Island, B.C.....	Sockeye salmon.....	5,176,000	5,176,000	5,176,000	505,000
1911	Cowichan lake.....	Cowichan lake, Vancouver Island, B.C.....	Cutthroat trout.....	3,278,881	3,278,881	3,278,881	5,223,100
1911	Kennedy lake.....	Kennedy lake, Vancouver Island, B.C.....	Speckled trout.....	210,244	210,244	210,244	7,754,521
1914	Gerrard.....	Gerrard, B.C.....	Steelhead salmon.....	1,041,410	1,041,410	1,041,410	13,855,046
1923	Nelson.....	Nelson, B.C.....	Sockeye salmon.....	62,892	62,892	62,892	8,787,881
1928	Penask lake.....	Penask valley, B.C.....	Kamloops trout.....	446,913	446,913	446,913	212,324
1928	Summerland.....	Okanagan lake district, B.C.....	Kamloops trout.....	141,715	141,715	141,715	126,250
			Kemmerly's salmon.....	327,500	327,500	327,500	1,535,280
			Rainbow trout.....	294,000	294,000	294,000	97,892
			Speckled trout.....	145,074	145,074	145,074	2,560,159
			Kamloops trout.....	688,000	688,000	688,000	446,913
			Kamloops trout.....	110,000	110,000	110,000	479,215
			Speckled trout.....	80,000	80,000	80,000	264,000
			Whitefish.....	17,550	17,550	17,550	460,589
				4,080,000	4,080,000	4,080,000	392,407
				338,551,212	338,551,212	338,551,212	718,778
				39,413,285	39,413,285	39,413,285	450,850
				152,796,350	152,796,350	152,796,350	107,350
				3,461,763	3,461,763	3,461,763	4,080,000
				3,232	3,232	3,232	570,287,381
				(f) 570,287,381	(f) 570,287,381	(f) 570,287,381	

(a) Subsidiary hatchery.

(b) All of these were planted from the 1929 Fall collection.

(c) Collecting camp.

(d) 240,000 of these planted from the 1929 Fall collection.

(e) 2,506,000 of these planted from the 1929 Fall collection.

(f) This distribution represents output 1929 resulting from autumn spawners of 1928.

In addition to the above 484,245 Cutthroat trout eyed eggs were purchased from S. S. Drew, Esq., Troy, Montana, and planted direct, as follows:—Fraser river watershed—

Sumas river..... 25,000

Kanaka creek..... 25,000

Nicomel river..... 434,245

484,245

NOTE.—Date of establishment is taken as the year during which the first distribution is made.

In addition to the experiments, tests, and investigations, with equipment, methods, food and selective breeding, that are continually under way at the various hatcheries, an extensive program of investigation and research, which is only limited by the difficulty that is experienced in finding properly trained workers to undertake definite problems of a fish cultural nature, is going on under the direction of the Research Committee on Fish Culture of the Biological Board of Canada.

The investigation that has been under way for several years at Cultus Lake hatchery, B.C., under the direction of Dr. R. E. Foerster, of the Biological Board, to determine the relative efficiency of natural reproduction, the planting of eyed eggs, and the distribution of free-swimming fry, was extended to include the production and distribution of fingerling and of yearling sockeye. This investigation when concluded will provide definite data to support or refute the numerous and diversified opinions that exist on this particular question at the present time. Considerable progress has been made in the investigation of various problems relating to fish culture by the Biological Board and its various committees. The nature of these investigations were briefly outlined in the report on fish culture for 1928. During the summer of 1929, the general region of the Gypsum Quarries, drainage from which polluted the water supply of the Windsor hatchery, Nova Scotia, was investigated on four occasions by the director and staff of the Fisheries Experimental Station at Halifax. The acid water was traced back to a stream of under-ground source, coming from the quarry workings. In February, 1929, it was found that the acid condition of the water, which had been absent in the fall of 1928, had returned and was of sufficient strength to kill fish eggs. The superintendents of hatcheries advise the director of the nearest Biological Station of any unusual condition or loss that they are unable to cope with, immediately such makes its appearance, and he arranges for such scientific or pathological investigation as the situation may call for. The department, and the senior fish cultural officer in each division, is at the same time fully advised, in order that prompt action may be taken.

A series of lectures, under the direction of Dr. W. A. Clemens, Director of the Nanaimo Biological Station, was given to superintendents of hatcheries in British Columbia in July, 1929. The lectures were held at the University of British Columbia, which also supplied necessary laboratory material and equipment. The Cultus Lake hatchery, B.C., is given over entirely to sockeye salmon investigations. All the space required, and the material and equipment available at all hatcheries, is at the disposal of the members of the Biological Board.

Arrangements have also been made for the construction of an experimental hatchery in connection with the Atlantic Biological Station at St. Andrews, N.B.

The Canadian National Railway, Canadian Pacific Railway, Dominion Atlantic Railway, Kettle Valley Railway, and the Esquimalt and Nanaimo Railway Companies continued their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants. The extent of this co-operation is indicated in the following summary:—

Railways	Total mileage on trip passes	Number of passages	Mileage baggage car permit			Number of cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	21,105	181	11,144	10,201	21,345	882	873	1,755	164
C.P.R.....	18,017	100	10,041	9,831	19,872	479	480	959	119
D.A.R.....	412	4	206	206	412	12	17	29	4
K.V.R.....	771	6	546	250	796	9	6	15	7
E. & N.R.....	363	5	212	212	424	17	17	34	6
	40,668	296	22,149	20,700	42,849	1,399	1,393	2,792	300

NOTE.—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one-way passage for cases or cans, either by permit, special authority or free transportation without a permit form.

Gratifying reports regarding the results that are apparent from the distribution of hatchery products continued to accumulate from all districts where fish cultural operations are carried on. In many districts local organizations such as boards of trade, angling and protective associations, service clubs, as well as private individuals, have provided transportation and otherwise assisted in distribution work. In a few instances, the necessary facilities were provided and allotments of eggs and fry that were made by the department were hatched, or retained and fed, for several months at the expense of the local organization, but under the general supervision of the nearest fish cultural officer.

Non-indigenous species have been successfully introduced into the waters of several localities, and waters that were previously barren have been made productive by distributions of hatchery output. The rainbow trout that were first introduced into Keefe's or Pisquid lake, P.E.I., continue to furnish good sport. On the opening day, July 1, 1929, almost everyone secured some fish, many of them their limit. Some specimens weighed as high as four pounds. The establishment of rainbow trout in this province, although as yet in a very limited area, affords some splendid angling at a time when the native speckled trout and Atlantic salmon are protected by a close season. Many large brown trout, some of spawning size, are being taken in loch Lomond, New Brunswick, where the first introduction was made in 1921. Rainbow trout are also reported to be now abundant in Clear lake, Charlotte county, New Brunswick. The first introduction was made in 1925, and limited distributions each year, including 1928. This lake is reported to have been barren of game fish before the introduction in question. The following rainbow trout, in addition to others, were taken by the Supervisor of Fish Culture for the district in June, 1929, when investigating conditions:—

One female, twenty inches long, three pounds weight.

One male, twenty and one-half inches long, three and one-quarter pounds weight.

One female, twenty-two inches long, four and one-half pounds weight.

In addition to those taken, many large fish were observed.

Cisco and whitefish, first introduced into the Quill lakes (alkaline) in 1924 and 1926 respectively, are reproducing. The cisco particularly are reported to be increasing rapidly, and during the winter of 1929-30 the commercial catch was approximately eight times as large as during the preceding year.

Brown and Loch Leven trout were also reported to be quite plentiful in various streams in the Cypress Hills district in southwestern Saskatchewan, where they were first introduced in 1924. This region was previously barren of game trout of any kind, but when the waters were thrown open to public angling during the summer of 1929 fine gamey trout, weighing as much as six pounds, were taken.

Equally satisfactory returns are apparent from the limited distribution of rainbow trout, which was made in Battle and Armstrong creeks in 1925. The success of this introduction at first appeared doubtful, but during 1929 rainbow, eighteen and one-half inches in length and weighing three and one-half pounds, were taken in Battle creek and other specimens measuring twenty inches and weighing slightly over four pounds were taken in Armstrong creek. A few years ago there were no game fish of any kind in this region, but the addition of some angling of high order has apparently influenced local interests to establish a summer resort.

Splendid returns were also apparent in 1929 from the Eastern speckled trout that were first distributed in the Medicine-Maligne lakes system in the Jasper park in 1928. This system was investigated and found to be barren of game fish by Dr. C. H. O'Donoghue, who was at that time a member of the Biological Board. Two distributions of speckled trout were made, the first in 1928 and the second in 1929. Mr. A. Bajkov, also an employee of the Biological Board, found that the fish had done extremely well, that some had reached a length of about eighteen inches, and would spawn in 1929, when from sixteen to eighteen months old.

The small-mouthed black bass, first introduced into St. Mary's lake, Salt Spring island, British Columbia, in September, 1920, have greatly increased in numbers and size. In 1929, it was a comparatively easy matter for an angler to obtain his limit catch, several specimens of seven pounds weight being taken.

The Causapschal Fishing Club generously agreed to the capture of parent salmon for hatchery purposes in their preserves. Operations were carried on under the personal direction of Superintendent Mowat of the Restigouche hatchery. 501,465 eggs were secured, the product from which will be returned to the Restigouche watershed.

The Restigouche Riparian Association placed its power boat and crew at the disposal of the department for collecting parent salmon from the fishing stands and transferring them to the salmon retaining pond at New Mills, New Brunswick.

The Armstrong Independent Fisheries Limited co-operated in making distributions to northern lake Winnipegosis, by providing their tug *Armenon* and part crew—the balance of the crew being drawn from the hatchery employees. After the fry were distributed, the hatchery staff assisted the boat crew to place the channel buoys.

The officials and employees of other federal departments, provincial officers, and officers and crews of fisheries patrol and protection boats, have been most cordial in their co-operation in all instances where they could be of assistance. The Research Committee of the Biological Board gave prompt and courteous consideration to all problems and difficulties that were referred to them. All of this assistance and co-operation is gratefully acknowledged, as is the present of 214,100 eyed salmon trout eggs from the Department of Game and Fisheries for Ontario. These eggs were desired for the purpose of continuing the introduction of the species into Clear lake, Manitoba, and Brightsand lake, Saskatchewan.

The department participated with assortments of hatchery products and fish indigenous to the respective districts, in making exhibits at the fairs or exhibitions held at the following places:—

Nova Scotia Guides' Association, Lake William, N.S.
Yarmouth, N.S.
Lunenburg, N.S.
St. John, N.B.
Toronto, Ont.
Boston, Mass.
Calgary, Alta.
Hastings Park aquarium, Vancouver, B.C.

From the 1928 collection, exchanges of eyed Atlantic salmon eggs were made with the United States Bureau of Fisheries and the Bureau of Fish Culture, California, details of which are given in a subsequent statement. Similar exchanges of Atlantic salmon eggs from the 1929 collection have been arranged.

As opportunity offered coarse and predaceous fish were destroyed. During September and October the fishery guardian, while rescuing stranded fish in back waters and eddies on Red Deer and Clearwater lakes, Alberta, destroyed 6,000 suckers; 1,000 carp were destroyed in Vasseaux lake, British Columbia, and smaller numbers of coarse fish at other points.

The department is most fortunate in having in its employ a staff of efficient fish cultural officers, who are most conscientious in the discharge of their duties. Several new appointments and the following promotions were made:—

G. Sutherland, from Hatchery Assistant to Superintendent at Antigonish hatchery.

H. V. Gates, transferred and promoted from Superintendent at Middleton, to Superintendent at the Yarmouth hatchery.

MARITIME PROVINCES, EASTERN DIVISION

District Supervisor of Fish Culture, James Catt

The quality of the fingerling output of both salmon and trout exceeded that of any previous year since the appointment of the present supervisor, in spite of the adverse conditions that were brought about by unusual drought with its consequent high-water temperatures that prevailed at many hatcheries. Particularly large fingerlings were produced at the new hatchery at Yarmouth, Nova Scotia. The salmon run to the Miramichi hatchery was large and the collection of eggs consequently much larger than it was the previous year. The run and collection from the Margaree was small. The number of parent salmon secured at the St. John pond was not as large as was expected, probably due to the construction work that was being carried on in St. John harbour. A larger collection was made at River Philip, and prospects at this point are quite promising. The collection of speckled trout in the Pollet's cove and Pleasant bay district was slightly larger than that of last year. A small but satisfactory collection for the initial season was made at Lochaber lake from the Antigonish hatchery. The collection of landlocked or sebago salmon eggs in the Chamcook lakes was slightly smaller than usual but the eggs were of better quality than in previous seasons.

Various experiments in the cross-breeding of Brown trout and Atlantic salmon, selective breeding of trout generally, exhaustion tests of salmon and trout during transportation, feeding experiments with different foods, fed in different rations, were made in this division during the season.

ANTIGONISH HATCHERY

Geo. Sutherland, Superintendent

This establishment was put in operation in the autumn of 1928. The hatchery grounds including the fry ponds were much improved, and the hatchery was operated to capacity in 1929. In March of that year it received 500,000 eyed salmon eggs (River Philip stock) from Bedford, and 250,000 (Morell river stock) from Kelly's pond. In January, 1929, it received an allotment of 483,000 eyed speckled trout eggs which were purchased from the Brook Trout Company of Penn Forest, Mauch Chunk, Pennsylvania, and 930,930 from Paradise Brook Trout Company, Cresco, Pennsylvania. It also received 10,000 such eggs, local hatchery stock, from Saint John in March. In November, 1929, it received 1,490,300 Atlantic salmon eggs from River Philip, N.S., egg collecting camp. 991,400 eyed speckled trout eggs were purchased from the American Fish Culture Company, Carolina, R.I. 50,571 speckled trout eggs were produced from the 1½-year-old trout in the hatchery ponds, and a small but satisfactory collection was made by the hatchery staff in Lochaber lake, Antigonish county, the first occasion on which speckled trout eggs had been collected from wild stock in the Antigonish district. A trap was operated in the inlet of the lake which took 367 fish between October 20th and November 28. The catch included 202 females, which yielded 264,100 eggs. The number and quality of the eggs secured in this initial season warrants a continuance of operations in 1930. Total distributions for the year 1929 resulting from the eggs collected in the autumn of 1928 supplemented by others received during the winter and spring of 1929 amounted to 1,035,780 Atlantic salmon and 1,054,055 speckled trout.

BEDFORD HATCHERY

George Heatley, Superintendent

The quota of 1,642,390 Atlantic salmon eggs for this establishment was secured from the recently opened egg-collecting camp at River Philip. In January, 1929, 473,170 speckled trout eggs, purchased from the Brook Trout Company of Penn Forest, Mauch Chunk, Pennsylvania, and 697,310 purchased from the Paradise Brook Trout Company, Cresco, Pennsylvania, were laid down in this establishment. The fry and fingerlings that resulted from these eggs were distributed during the season of 1929. In December of the same year 1,052,175 speckled trout eggs, purchased from the American Fish Culture Company, Carolina, Rhode Island, were received. The fry from this allotment will be distributed in 1930. In March, 1929, Bedford shipped to Antigonish 500,000 eyed Atlantic salmon eggs. Bedford distributions from 1928 collections and eggs received early in 1929 amounted to 1,161,500 Atlantic salmon and 1,377,230 speckled trout.

A unit of three cement rearing ponds was built at the south side of the area where the wooden rearing troughs are now located. Dimensions are as follow:—

One pond—length 29 feet over all, width 4 feet; one pond—length 31 feet 6 inches over all, width 4 feet; one pond—length 34 feet 6 inches over all, width 4 feet. The depth of each is 14 inches at upper end sloping to 15 inches with well at outlet.

Salmon eggs and trout fry, as required, were supplied by this hatchery to Dalhousie University and the Biological Station at Halifax.

MARGAREE HATCHERY

L. J. Burton, Superintendent

The total output of the Margaree salmon retaining pond, viz., 1,998,534 eggs, was laid down in this establishment. The hatchery ponds produced

106,855 speckled trout eggs and 166,417 were collected from wild fish at Polletts cove, Pond river and Red river, in the Pleasant bay district. In March, 1929, Margaree shipped to the Lindloff sub-hatchery 300,000 eyed Atlantic salmon eggs. From the autumn collections of 1928 Margaree in 1929 distributed 1,955,000 Atlantic salmon and 189,822 speckled trout.

LINDLOFF HATCHERY

M. Kyte, Officer in Charge

The Lindloff hatchery, subsidiary to Margaree, was operated in the usual manner, and received its supply of 300,000 eyed Atlantic salmon eggs, from the Margaree hatchery. From this number 297,600 were hatched and distributed into local waters.

MARGAREE SALMON RETAINING POND

J. P. Chiasson, Superintendent

The parent salmon were purchased from twenty of the local fishermen, who have pooled their interests and who operate one large trap suitable for taking parent fish for hatchery purposes, instead of twenty small individual nets. The first salmon were placed in the pond on September 15, and the total catch between that date and November 8 amounted to only 290 fish. Stripping operations extended from November 11 to December 2, a total of 1,998,534 Atlantic salmon eggs being secured, all of which were laid down in the Margaree hatchery for incubation.

MIDDLETON HATCHERY

F. M. Millett, Superintendent

This establishment handles Atlantic salmon and speckled trout, but makes no independent collection. Its allotment of 1,953,700 Atlantic salmon eggs was received in October and November from the Miramichi pond, and in January 1,653,635 speckled trout eggs were received from the Paradise Brook Trout Company of Cresco, Pennsylvania. The output from this speckled trout allotment was distributed during 1929. In December of the same year 1,143,544 speckled trout eggs were received from the American Fish Culture Company, Carolina, Rhode Island. The resultant fry will be distributed in 1930. In February, 1929, Middleton shipped Windsor 4,000 Atlantic salmon and 6,700 speckled trout eggs to test out the water at that establishment. Middleton distributed 1,007,000 Atlantic salmon and 1,367,530 speckled trout from eggs received in the autumn of 1928, and January, 1929, respectively.

RIVER PHILIP EGG COLLECTING CAMP

George Heatley and George Sutherland, Officers in Charge

The collection of Atlantic salmon eggs in River Philip amounted to 3,132,690, an increase of nearly 700,000 over the initial season of 1928. The first fish were secured on October 14, and operations were continued until November 16, with a total catch of 846 salmon. Stripping operations covered the period from October 28 to November 19. The eggs secured were divided between Bedford and Antigonish hatcheries as follow: Bedford. 1,642,390; Antigonish, 1,490,300.

WINDSOR HATCHERY

F. M. Millett, Superintendent

The Windsor hatchery was not in active operation because its water supply was made absolutely unsuitable through drainage from Gypsum quarries of the district. As the water supply appeared to have improved in quality, a small number of speckled trout and salmon eggs were laid in the troughs. The hoped for improvement in the water had not taken place and the eggs in question were soon a total loss.

YARMOUTH HATCHERY

H. V. Gates, Superintendent

The new salmon and trout hatchery, which was opened at Lake George in Yarmouth county in the autumn of 1928, was operated to capacity. The grounds and surroundings were generally improved, and in view of the satisfactory results obtained in the original unit, a second unit of seven ponds, each 150 feet long, 4 feet wide and 2 feet 6 inches deep, each subdivided into five shorter ponds, 30 feet long, were constructed in the autumn of 1929. As this hatchery was only opened in the late autumn of 1928 no local collection of eggs was undertaken, but the following allotments of eyed Atlantic salmon eggs were laid down in March, 1929:—

From St. John.....	500,000
“ Grand Falls.....	500,000
“ Florenceville.....	250,000

Four hundred and eighty thousand nine hundred speckled trout eggs, purchased from the Brook Trout Company, and 1,050,000 purchased from the Paradise Brook Trout Company, were laid down in January, with a small allotment, viz., 10,000, from domesticated St. John stock.

An effort was also made to purchase Atlantic salmon for hatchery purposes from the herring traps that are operated off Port Maitland, Yarmouth county. Allen's lake was fitted up as a retaining pond. The season was well advanced when the necessary arrangements had been completed, and a total of only forty-eight fish was obtained from the traps and placed in the retaining enclosure. While the return in eggs was limited, the results warrant a resumption of operations on a larger scale during the coming season.

An exhibit of salmon and trout fingerlings, produced at this establishment in 1929 was displayed during the annual tournament of the Nova Scotia Guides' Association, which was held at Lake William. The fish were retained in enclosures in the outlet of the lake at the entrance to Lake William park, where the tournament was held.

Atlantic salmon and trout, the product of this establishment also formed a part of the Fisheries exhibit that was made at the Lunenburg Fair and Yarmouth Exhibitions. All exhibits created much interest and favourable comment.

In the autumn of 1929, 1,998,356 Atlantic salmon eggs from the Miramichi pond, and 74,500 from Allens lake, Nova Scotia, were received. In December 1,090,000 eyed speckled trout eggs, purchased from the American Fish Culture Company, Carolina, Rhode Island, were laid down in this hatchery. Small numbers of speckled, brown, Loch Leven and hybrid trout eggs were obtained from the fish in the hatchery ponds. These numbers respectively were 4,100, 2,050, 1,105 and 2,050. The ponds in question gave good results, and a large number of healthy, vigorous fingerlings of more than average size were produced. The distribution from Atlantic salmon eggs received during March of 1929 amounted to 1,139,975, and from speckled trout eggs received during December, 1928, and early 1929, was 1,477,475.

FLORENCEVILLE HATCHERY

K. G. Skillington, Superintendent

The Florenceville hatchery, which was put in operation in 1928, is now functioning to the full capacity of existing facilities. It received 2,135,500 Atlantic salmon eggs from the St. John pond in October, 1929. Five hundred and sixty-eight thousand six hundred and thirty-one speckled trout eggs were obtained from the hatchery ponds that year. This collection was supplemented by 475,020 eyed speckled trout eggs, which were purchased from Brook Trout Company of Penn Forest, Pennsylvania, in January, and 494,750 from the American Fish Culture Company of Carolina, R.I., in December, 1929. Out-going shipments in March, 1929, were as follow: to Miramichi hatchery 500,000 Atlantic salmon eggs; to Yarmouth hatchery 250,000 Atlantic salmon eggs.

The hatchery premises were generally improved. A new coal and storage room, 18 feet by 16 feet was built. The food room and refrigerator or cold storage room were enlarged, and a separate drain pipe laid therefrom to the brook. Tie rods were embedded in the cement in the tops of the walls of the six retaining ponds; the damaged wall between retaining ponds seven and eight was broken up and removed, making one larger pond out of what had previously been two; a new earthen pond was excavated in a natural hollow at the front of the hatchery property, and the small earthen pond that was excavated in 1928 was deepened and enlarged. Distributions made in 1929 from eggs received in 1928, supplemented by trout eggs received in January, 1929, amounted to 1,516,624 Atlantic salmon and 740,002 speckled trout.

GRAND FALLS HATCHERY

W. A. McCluskey, Superintendent

No independent collections of eggs were undertaken by the staff of this establishment, which received its allotments from other sources. In January and February, 1929, 879,420 speckled trout eggs were received from the Paradise Brook Trout Company, Cresco, Pennsylvania. In the autumn of the same year, 3,078,600 green Atlantic salmon eggs were received from the St. John pond, and 988,800 speckled trout eggs from the American Fish Culture Company, Carolina, Rhode Island. Grand Falls in March shipped to Yarmouth hatchery 500,000 Atlantic salmon eyed eggs, and in April to Tobique hatchery 500,000 of the same species.

The hatchery and dwelling house were generally repaired, both buildings were shingled and painted, the water-pipe line to the dwelling house was relaid, and other minor repairs were made. From the autumn collection of 1928 and from trout eggs received early in 1929, Grand Falls hatchery distributed 2,026,287 Atlantic salmon and 797,574 speckled trout.

TOBIQUE HATCHERY

J. M. Butler, Officer in Charge

Tobique hatchery, which is subsidiary to Grand Falls, and is utilized to facilitate the distribution of Atlantic salmon in that stream, received 500,000 eyed eggs of that species in April from Grand Falls, which resulted in a distribution of 488,000 salmon fry.

A new water-supply dam was built, seventy-five feet above the old dam, which should insure a larger and more reliable water supply.

MIRAMICHI SALMON POND

Frank Burgess, Superintendent

The Superintendent of the Miramichi hatchery is responsible for the operation of both the Miramichi hatchery and the Miramichi salmon retaining pond. The parent salmon for the pond are purchased by tender and contract from the late summer and early autumn runs, which usually occur in large numbers in the Miramichi and its tributaries. No difficulty was experienced in securing all the parent fish required, as is indicated by the catch and delivery of 3,454 salmon taken in two nets operated by the successful tenderer between September 11 and October 7. Stripping operations extended from October 17 to November 15. A total of 14,410,663 salmon eggs were obtained. The contractor's nets were not fished continuously during the above mentioned period, and did not operate from September 27 to October 3 on account of low water conditions, particularly in the pond in which the salmon were impounded. The salmon impounded were actually taken in seventeen days' fishing. The eggs secured from Miramichi pond were allotted as follow:—

Middleton hatchery.....	1,953,700
Yarmouth hatchery.....	1,998,356
Miramichi hatchery.....	10,458,607
	<hr/> 14,410,663

MIRAMICHI HATCHERY

Frank Burgess, Superintendent

In addition to the eggs held over from the 1928 fall collection, Miramichi received 500,000 Atlantic salmon eggs from Florenceville in March, 1929. The distribution of fingerlings from the Miramichi hatchery during 1929 amounted to 4,175,089 Atlantic salmon, and 96,474 speckled trout. The latter were hatched from 100,395 eggs secured from the Paradise Brook Trout Company. On account of exchange agreements the following outgoing shipments of Atlantic salmon eyed eggs were made: To United States Bureau of Fisheries, Craig Brook hatchery, East Orland, Maine, 1,000,000; to Bureau of Fish Culture, Port Seward hatchery, California, 28,000 eggs. Both allotments of salmon eggs reached their destinations in uniformly splendid condition. From the Miramichi salmon pond 10,458,607 salmon eggs were received during the autumn of 1929.

General repairs were effected, including the construction of a store-house and ice-house combined, the addition of one bedroom and the installation of sanitary fittings in the dwelling.

The Supervisor of Fisheries for the district reports that he saw a salmon caught at the mouth of Cains river, a tributary of the Miramichi, on the evening of May 23, 1929, weighing about eighteen pounds, which was in a spawning condition; that when the fish was held up it extruded eggs which were as large as field peas. This is the first Atlantic salmon in a spawning condition during the spring months that has been brought to the attention of this department.

NEW MILLS POND

Wm. White, Superintendent

The salmon for the New Mills Pond are purchased from commercial fishermen of the vicinity. Most of the fish impounded are obtained from the early spring run. In 1929, out of a total of 420 fish, 253 were secured by June 30, and the balance, 167, were taken between that date and July 15. Spawning operations extended from October 22 to November 6. A total of 1,635,300 salmon eggs were secured, all of which were laid down in the Restigouche hatchery.

RESTIGOUCHE (FLATLANDS) HATCHERY

W. A. Mowat, Superintendent

Fly fishing was reported as not being up to the average of recent years during the early part of the season on the Restigouche and its tributaries, but later in July fish became more plentiful and good angling was experienced. The Matamajaw Salmon Club, which controls a portion of the Matapedia river, very kindly agreed to the department securing parent salmon in its waters. The operations were under the personal direction of the superintendent of the Restigouche hatchery. The first fish were secured on September 16, and a total of 154 were taken between that date and October 25. Spawning operations covered the period between October 20 and 29, a total of 501,465 salmon eggs being secured, all of which were laid down in the Restigouche hatchery. The total production of the New Mills pond, viz., 1,635,300, and 264,345 speckled trout eggs were also handled at this hatchery. These latter eggs were purchased from Paradise Brook Trout Company, Cresco, Pennsylvania. In April, 1929, Restigouche forwarded to Nipisiquit sub-hatchery 401,192 eyed Atlantic salmon eggs. Distributions made from Restigouche in 1929 amounted to 1,477,854 Atlantic salmon and 156,725 speckled trout.

NIPISQUIT HATCHERY

J. T. Comeau, Officer in Charge

The Nipisiquit hatchery is subsidiary of the Restigouche establishment. It received its allotment of 401,192 salmon eggs from Restigouche, which resulted in a distribution of 380,284 fry.

ST. JOHN HATCHERY

J. D. Nichol, Superintendent

The St. John hatchery has a larger and more extensive system of ponds than any other hatchery operated by the department, and handles a greater variety of fish, including Atlantic salmon, landlocked or sebago salmon, brown, Loch Leven, rainbow and speckled trout. Numerous experiments in selective breeding, cross breeding, feeding, etc., are carried on at this establishment, which also supplies the St. Andrews Biological Station with eggs and fry for experimental purposes.

This hatchery can supply its own requirements of trout eggs of the various kinds, and is the only one in the Eastern Division that produces eggs in quantity of species other than speckled trout from domesticated brood stock. It also acts as a clearing house for most of the shipments of eggs that are made to the Maritime Provinces. From purchased speckled trout eggs coming from firms in the United States, St. John retained the following numbers as test allotments: During January from Brook Trout Company, 26,320, and from Paradise Brook Trout Company, 38,480; during December from American Fish Culture Company, 46,680. During the calendar year 1929 the following collections were made from domesticated stock:—

Rainbow trout.....	49,445
Brown trout.....	251,986
Loch Leven trout.....	46,592
Hybrid trout.....	44,581
Speckled trout.....	1,183,402

Specimens representative of the production of this hatchery were exhibited at the Toronto Exhibition, the Lunenburg Fair, and the Yarmouth Fair.

Eighty-four thousand landlocked or sebago salmon eggs, collected in the Chamcook lakes by Assistant Butler, of Bedford, and Assistant Heatley, of Middleton, were laid down for incubation in St. John hatchery during the autumn of 1929. Its quota of Atlantic salmon eggs, 1,054,200, were secured from St. John salmon pond.

Outgoing shipments of eggs from St. John hatchery in March were: To Yarmouth, 500,000 Atlantic salmon and 10,000 speckled trout; to Antigonish, 10,000 speckled trout; and in May to Kelly's pond hatchery, 18,792 rainbow trout.

General repairs were effected, including repairing of the ponds where necessary, the construction of four ponds (each 175 feet long, 4 feet wide, and 2 feet 6 inches deep), repair and painting of the dwelling, etc.

Distributions for the year were: Atlantic salmon, 433,866; brown trout, 101,423; landlocked or sebago salmon, 94,713; Loch Leven trout, 40,398; rainbow trout, 318; and speckled trout, 668,275.

ST. JOHN SALMON RETAINING POND

J. D. Nichol and K. G. Shillington in charge

J. D. Nichol is responsible for the operation of this establishment during the greater part of the season, but on account of the volume and importance of the operations at the St. John hatchery, Mr. Shillington was in charge and responsible for stripping operations at the salmon pond. The parent fish are purchased from the early run commercial catch. A total of 980 were secured from this source between June 4 and August 20. Stripping operations covered the period between October 26 and November 8. A total of 6,268,300 salmon eggs were secured, which were allotted as follows: Florenceville, 2,135,500; Grand Falls, 3,078,600; and St. John, 1,054,200.

The run of salmon to the St. John harbour during the season was below the average, and the catches of the commercial fishermen were correspondingly small. A possible reason for the decrease in the catch of the harbour nets may be due to the new harbour development. The stretch of water known as Butter-milk channel, between Navy island and the mainland, was almost completely closed by a coffer dam, and the catch of the two weirs in this channel was almost a failure. The coffer dam also affected the currents, making it very difficult for the fishermen to maintain their weirs on the north side of the island.

A temporary pipe line was extended from the St. John water supply to the pond, thus assuring fresh water at all times for washing the fish and washing and fertilizing the eggs.

KELLY'S POND HATCHERY

F. C. Hayley, Superintendent

Collections of Atlantic salmon, speckled trout, and rainbow trout eggs were made from this hatchery. The salmon eggs were collected in the Morell river, where the parent fish were captured by means of a trap-net between October 18 and November 23. Two hundred and fifty-seven fish were secured in this way, which yielded 833,800 salmon eggs. Spawning extended from October 26 to November 29. The run of salmon in the Morell river was smaller than usual, principally on account of low water conditions. Two hundred and nine salmon entered the trap and the balance of 48 were captured on the spawning grounds. The total number caught is not, however, considered a fair criterion of the number in the river, as there are several miles of suitable spawning grounds below the location of the trap-net, and during a low water season when there are no freshets, a large percentage of the salmon remain in the lower reaches and do not ascend to the point where the trap is located. While the equipment is

supplied by the department and the work is under the direction and supervision of hatchery officers, the fish are actually caught and guarded, until they are stripped and liberated, at the rate of \$1 each.

Forty-six thousand and seventy-nine speckled trout eggs were collected in the hatchery water supply pond, and 305,898 were purchased from the owners or lessees of private ponds at the rate of \$1 per thousand for eyed eggs. The equipment is furnished by the Department, the parent fish are captured by the owners or lessees of the ponds, the fish are stripped and liberated by hatchery employees, and the owners or lessees are paid at the rate mentioned for eggs that reach the eyed stage.

In 1929 speckled trout eggs were secured on this basis from Blooming Point, Essory's, Gillan's, Ing's McKinnon's and Watt's ponds and from the Morell river.

The local collections of speckled trout eggs were augmented by an allotment of 490,300, which were purchased in December from the American Fish Culture Company of Carolina, Rhode Island; 550,260 such eggs were also received from the Paradise Brook Trout Company, Cresco, Pa., in February, 1929.

Twenty-six thousand five hundred and thirty-five rainbow trout eggs were collected in Pisquid or Keefe's lake, which received its first allotment of such fry in 1925, and which, previous to this date, contained no rainbow trout. The rainbow trout collection was augmented by a small shipment of 18,792 from the St. John hatchery ponds. In March Kelly's pond hatchery shipped to Antigonish 250,000 eyed Atlantic salmon eggs.

The distribution from this hatchery in 1929 was 1,015,853, made up as follows: 308,127 Atlantic salmon, 682,354 speckled trout, and 25,372 rainbow trout fry and fingerlings. A new water supply dam was constructed and a new pipe line laid, buildings were repaired and painted, a bathroom and sanitary fittings were installed in the Superintendent's dwelling, and a portable stripping shed was built at the Morell river collecting camp.

PRAIRIE PROVINCES—CENTRAL DIVISION

District Supervisor of Fish Culture, S. J. Walker

Test fishing for the purpose of determining the numbers of eggs available under average conditions for fish cultural purposes were carried on at Cold and Whitefish lakes in northern Alberta, at Cameron lake in southern Alberta, at McIntosh creek, Cochin, northern Saskatchewan, and at Pigeon bay, lake Winnipeg. A new hatchery built in 1928 at Swan Creek, lake Manitoba, for the propagation of pickerel, was put into operation in the spring of 1929. A series of rearing ponds were also constructed late in the season at the Waterton Lakes hatchery and will be available for use in 1930.

Details of the operations for 1929 at each of the several establishments are given in subsequent statements.

GULL HARBOUR HATCHERY, LAKE WINNIPEG

C. P. Paulson, Superintendent

The greater part of the whitefish fry was distributed by a scow and motor boat in the southerly portion of lake Winnipeg, but over 18,000,000 eggs were placed in the hatching battery on the C.G.S. *Bradbury* and taken to the Berens River district. The resultant fry were distributed, as they hatched, over a wide area. Total distributions for the year were: 5,395,000 pickerel and 74,500,000 whitefish.

The 1929 supply of whitefish eggs was collected in a pound-net operated by the hatchery staff at the mouth of the Little Saskatchewan or Dauphin river. The leads of this net, which close the river, were raised from 6 o'clock Saturday evening until 6 o'clock on the Sunday evening following throughout operations. The net was in commission on September 21 and was removed from the river on November 1.

Low water conditions were experienced, with very little current in the river, which was probably the reason for the run not being more pronounced. A total of 11,558 fish was taken, of which only 3,006 females were stripped. A total collection of 75,150,000 whitefish eggs was made, all of which were laid down in the Gull Harbour hatchery.

Experimental fishing, with a view to locating other sources of supply of whitefish eggs than the Little Saskatchewan or Dauphin river, was carried on in Pigeon bay. This experimental fishing was in charge of Assistant P. E. Geary of the Gull Harbour hatchery. The tests in question were made at different points with gill-nets, but the catch throughout was light, and there did not appear to be any definite run of whitefish into the bay.

Conditions and facilities for retaining the small number of fish that were caught were also poor, and the results altogether were not promising from the standpoint of egg collection—a total of 511 fish only, of which 104 females were stripped, yielding 1,800,000 whitefish eggs. These eggs were planted in a green stage in Pigeon bay.

A collection of pickerel eggs was undertaken from the hatchery at the quarry. Owing to the lateness of the season, ice prevented the setting of the nets until May 24, when the greater part of the run had passed. Seven hundred and six fish in all were taken at this point, which yielded 7,650,000 pickerel eggs.

Experimental fishing, with a view to locating more productive sources of supply for pickerel eggs, was carried on at Leaf river and Pigeon bay. These operations were also under the direction of Assistant Geary. Mr. Geary, with his crew, left the Gull Harbour hatchery on April 8, proceeding via Selkirk, Winnipeg and Gypsumville by rail, thence by team to the mouth of the Dauphin river. The roads at this time were almost impassable, and on arrival at the mouth of Dauphin river, the lake was unfit for travel by dog team. Conditions, however, improved and crossing of the lake to the east shore was undertaken on April 25. Conditions throughout were generally unfavourable and much inconvenience was caused by floating ice. As soon as the ice moved from the shore of the lake, operations were transferred to Pigeon bay. Operations were not promising from the standpoint of egg collection, as a total of only 391 pickerel was caught, 244 at Leaf river and 147 at Pigeon bay. These fish were liberated unstripped.

The hatchery buildings were generally repaired, and the U-shaped battery was replaced with two single type batteries with new floor tanks.

SWAN CREEK HATCHERY, LAKE MANITOBA

George E. Butler, Superintendent

The pickerel hatchery which was constructed in 1928 at Swan Creek, lake Manitoba, was equipped and put in operation in the spring of 1929. The hoped-for run of parent fish was more than realized and between April 28 and May 16, 44,114 and 4,561 pickerel were taken respectively in the two nets that were operated; 6,270 female fish were liberated before any stripping commenced, but 5,370 were stripped; 253,810,000 pickerel eggs were obtained; 169,830,000 of these were laid down in Swan Creek hatchery, and the balance, 83,980,000, planted out in Swan and Marshy Point creeks. At the close of operations, 41,366 unstripped fish were liberated. Some difficulty was experienced with dirty water which caused considerable loss; 139,980,000 eggs and fry were distributed.

WINNIPEGOSIS HATCHERY

George E. Butler, Superintendent

Three pound-nets were set on the usual grounds at the entrance to Waterhen river and a total of 9,039 whitefish were taken. The first crate boat load of whitefish transferred to the lagoon at the hatchery did not do well, as the water was very shallow. The balance of the catch was therefore retained at the Waterhen camp and was only removed to the lagoon after the fish had begun to spawn.

Weather conditions were generally favourable throughout the collecting season, and a total of 106,315,000 whitefish eggs was secured, of which 20,000,000 were taken to the Fort Qu'Appelle hatchery by Superintendent Mapes, who was assisting with the operations on lake Winnipegosis, and the balance, 86,315,000 eggs, was laid down in Winnipegosis hatchery.

Through the courtesy of the Department of Game and Fisheries for Ontario, 115,500 salmon trout eggs were laid down on March 2 in splendid condition, and the resultant fry were distributed in Clear lake in the Riding mountains. Distributions for the year amounted to 109,500 salmon trout and 66,500,000 whitefish.

The motor boats, including the gasoline engines, were overhauled and repaired. A portion of the lagoon at the hatchery was dredged and deepened by the Department of Public Works, the material removed being utilized for levelling and improving the hatchery surroundings.

FORT QU'APPELLE HATCHERY

W. C. Mapes, Superintendent

The total distribution of all species from the Fort Qu'Appelle hatchery in 1929 was 48,622,442 by species as follows: Loch Leven trout, 133,714; pickerel, 30,002,500; salmon trout, 91,228, and whitefish, 18,395,000. In addition to the hatchery fry disposed of seven waters were stocked by the hatchery staff by transfer of fish from other waters. A new location at Arnold's point was selected for the collection of pickerel eggs where 11,690,000 eggs were obtained between May 3 and May 16. Ninety-eight thousand six hundred salmon trout eggs generously donated by the Department of Game and Fisheries for Ontario were received in March from the Port Arthur hatchery. The resulting fry were all distributed in Brightsand lake with a view to establishing the species in that district. Thirty-one thousand and 103,000 brown trout eggs were received respectively from Trout Brook Company, Hudson, and Cedar Island Lodge, Brule, Wisconsin. The resultant fry will be distributed in the streams in the height of Cypress Hills district where previous introductions have done exceedingly well. No collection of whitefish eggs was undertaken in the Fort Qu'Appelle district. The superintendent assisted in similar operations from the Winnipegosis hatchery from which source 20,000,000 eggs were received. Twenty-one million three hundred and sixty-two thousand whitefish eggs and 43,010,000 pickerel eggs received from experimental fishing in McIntosh creek between Jackfish and Murray lakes at Cochin, Saskatchewan, were laid down in this establishment. Fort Qu'Appelle forwarded to Summerland 5,000,000 eyed whitefish eggs and to Banff 1,360,000 pickerel eyed eggs.

COCHIN EGG COLLECTING STATION

O. Bright, Officer in Charge

Experimental fishing was continued under the direction of Assistant O. Bright, of the Fort Qu'Appelle hatchery, in the creek between Jackfish and Murray lakes at Cochin in the spring and autumn of 1929 with a view to ascer-

taining the numbers of pickerel and whitefish eggs that are obtainable under normal conditions at this point for hatchery purposes. The results far exceeded those obtained in any other year. Seven thousand eight hundred and sixty pickerel were caught and impounded between April 15 and May 15. Sixty-seven million sixty-five thousand pickerel eggs were taken, of which 43,010,000 were transferred to the Fort Qu'Appelle hatchery and 24,055,000 were planted in Murray lake. One thousand eight hundred and six females were stripped and 560 were liberated, in good condition, without having been stripped. Had it been desired, a considerably larger collection could have been made. Similar operations were conducted in the autumn and 25,357 whitefish were caught and impounded between September 21 and November 30. Five thousand six hundred and twelve of this number were stripped and 63,687,000 whitefish eggs secured; 21,362,000 of this number were laid down in Fort Qu'Appelle hatchery and the balance, 42,325,000 planted out in Cochin creek. The balance of the fish in the retainers were liberated, it having been demonstrated that conditions were favourable in so far as numbers and facilities for handling the fish were concerned. The whitefish of Jackfish and Murray lakes are late spawners. The first whitefish eggs in 1929 were obtained on November 18 and the last on December 4. On the latter date, quite a number of the fish liberated were not ripe. Reports of early spawning whitefish in Chitek lake about sixty miles to the northward were investigated and found to be correct. On October 13, twelve whitefish of large size were secured, the largest weighing eight and one-quarter pounds, and the smallest four and three-quarter pounds with an average weight for the lot of six and three-quarter pounds each. Of this number, seven were males and were spawning freely. Of the five females, three were spawning freely. One had spawned out and one was quite ripe. Chitek lake is the only body of water in this district of which the department is aware in which the early spawning of whitefish takes place.

BANFF HATCHERY

J. E. Martin, Superintendent

The Banff hatchery covers an extensive area and handles pickerel, rainbow, cutthroat, brown and Loch Leven trout. The greater portion of the eggs are obtained by purchase or exchange. In 1929 the following eggs were secured:—

Pickereel.....	1,360,000 from Fort Qu'Appelle.
Rainbow.....	751,200 from Troy, Montana.
Cutthroat.....	1,088,000 from Butte, Montana.
Loch Leven.....	288,217 from Pozeman, Montana.
Brown trout.....	210,830 from Brule, Wisconsin.

Initial distributions of Loch Leven were made in Road creek, tributary to Little Red Deer river and in several tributaries of the James river within the forest reserve. Two hundred and forty thousand cutthroat trout eggs were planted in the lakes in the Bear Creek valley which lies to the northwest of lake Louise but on the other side of the divide which drains to the North Saskatchewan river. The pass is 6,860 feet high and is connected with lake Louise station by a pony trail. It is twenty-eight miles from the station to the summit of the pass. Near the mouth of Bear creek is a waterfall which has proved to be a barrier against any fish ascending to the waters above. The lakes in question were, therefore, devoid of fish life. The distance was too great and transportation facilities too primitive to attempt to stock with fry. Consequently eggs were planted in the gravel in Silver Horn creek where the most suitable conditions were found. The eggs were carried as far as feasible by pack horse but the final stages had to be negotiated on foot over extremely rough country. A small number of salmon trout eggs, viz., 9,500, were secured

from the fish that are held for exhibition purposes in the hatchery pond, and a further number, viz., 44,540, from Cold lake in northern Alberta. A shallow pond, approximately one-quarter of an acre in area, was excavated in what had previously been a sulphur slough. The sulphur water seepage has been diverted and the pond is being utilized for experimental fish rearing purposes. Loch Leven fingerlings were supplied the Forestry Service for the annual exhibit that it makes at the Calgary Exhibition. Fifty thousand rainbow eyed eggs were supplied to Jasper hatchery in May. Two million, seven hundred and twenty-seven thousand eight hundred fish of all species were distributed from the Banff hatchery in 1929 by species as follow: Brown trout, 43,800; cutthroat trout, 1,042,000; Loch Leven trout, 332,000; pickerel, 670,000; rainbow trout, 591,000; and salmon trout, 49,000.

SPRAY LAKES HATCHERY

J. E. Martin, Superintendent

Spray Lakes hatchery is subsidiary to Banff and is carried on under its direction. Two trap-nets are operated, one at the head of the chain of lakes and the other in the creek connecting the first and second lake. A late season with low water was experienced with some interference to the nets when the freshets occurred. The collection, however, was better than that of last year, amounting to 505,105 cutthroat trout eggs from which 322,920 eggs and fry were planted out.

COLD LAKE EGG COLLECTING STATION

J. E. Martin, Superintendent

Test fishing was continued in Cold lake northeast of Edmonton under the direction of Superintendent Martin of the Banff hatchery with a view to determining the numbers of salmon trout eggs that might be expected in this lake under average conditions. There was a good showing of parent fish at each of the points selected, viz., French bay and Murray island, but, owing to unfortunate delays, the equipment was not in place sufficiently early to intercept the main movement of spawning fish. No eggs were taken at French bay, but 66,475 were secured at Murray island. All of these eggs, except for some lost during retention, were shipped to Banff hatchery.

JASPER SUB-HATCHERY

In January, 1929, 251,664 speckled trout eggs from Paradise Brook Trout Company were laid down in Jasper hatchery; 208,786 of these were distributed into the Medicine-Maligne Lake system of Jasper park. This distribution constitutes the second introduction of the species to the system. This subsidiary hatchery was fitted up particularly for the introduction of the species to this system which was previously barren of fish life. The eastern speckled trout have done extremely well in their new environment as specimens were observed eighteen inches in length and in a spawning condition in the summer of 1929 when they were only sixteen months old. In view of the splendid returns that are in evidence, further introductions do not appear to be necessary at the present time. Fifty thousand rainbow trout eggs from the Banff hatchery, as well as the speckled trout eggs mentioned above, were cared for by the Parks Branch at this hatchery under the general direction of the Supervisor of Fisheries for Alberta. The rainbow fry, 45,387 in number, were distributed by Assistant Bright of the Fort Qu'Appelle hatchery, the necessary assistance, including trucks, pack horses, etc., being provided by the Parks Branch, Department of the Interior.

LESSER SLAVE LAKE (CANYON CREEK) HATCHERY

H. J. Reid, Superintendent

A satisfactory collection of pickerel eggs (58,125,000) was obtained, when it is considered that this is the first attempt in this direction in the Lesser Slave Lake district. The collection was made in Buffalo bay at the westerly end of the lake, parent fish being taken in trap and hoop-nets. Considerable difficulty was experienced on account of varying water levels and floating debris. An equally satisfactory collection of whitefish eggs was made in the autumn. Forty-three million two hundred and seventy-eight thousand were secured from fish taken in pound-nets in Lesser Slave lake, 48,895,000 in Whitefish river, and 18,380,000 in Mink creek. Transportation of eggs from the last mentioned camps presents some difficulty as it involves carriage by truck and wagon over indifferent and poor roads, a distance of fifty-seven miles to Enilda railway station. Drift ice also interfered with operations in Lesser Slave lake, necessitating the removal of pound-nets early in November. The total collection of whitefish eggs was increased to 110,553,000 as against 18,500,000 in 1928. The hatchery property was further improved, fenced and the plant and equipment put in first-class condition. Distributions for the year amounted to 19,150,000 pickerel and 10,355,000 whitefish.

WATERTON LAKES HATCHERY

G. E. Bailey, Superintendent

The new hatchery which was placed in operation in 1928, in the Waterton Lakes park, southern Alberta, this year distributed a total of 1,444,715 fry and fingerlings made up of 871,265 cutthroat and 573,450 rainbow trout. Most of the eggs were secured from outside sources, viz., 692,930 rainbow eggs (purchased from Troy, Montana); 504,000 cutthroat eggs (purchased from the same source); and 500,180 cutthroat eggs (exchange with the United States Bureau of Fisheries from Yellowstone park). Test fishing for the purpose of determining the quantities of eggs that might be procured locally was also carried on and nets were operated in Cameron creek, Cottonwood creek, the Dardanelles and in Cameron lake. With the exception of Cameron lake, these operations were not successful. The Cameron creek net was repeatedly carried out by freshets and floating debris. Similar conditions were experienced in Pass creek. The nets at the Dardanelles were also flooded, the water rising fourteen feet on one occasion. The operations at Cameron lake were more encouraging where 34,040 rainbow trout eggs were obtained. A combination icehouse and garage, a dam in the creek, one hundred and sixty feet of flume and five earthen ponds, each 50 feet long and six feet wide were constructed, and the grounds generally were much improved.

BRITISH COLUMBIA—WESTERN DIVISION

District Supervisor of Fish Culture, C. W. Harrison

Very encouraging runs of sockeye occurred to various sections of the Fraser River watershed, and reports indicate that the run generally on the Fraser river was the largest since 1917. An interesting feature of the season was the large proportion of early run fish of the finest quality, which proceeded to the upper waters of the watershed. A splendid run occurred in the Stuart Lake district; the best run for the past twelve years to Bowron lake, and the best for the past twenty years to the Chilcotin district. A good run also appeared at the Shuswap lake, while a light run, but larger than that of four years ago, occurred at Quesnel lake. Good runs were observed at Pitt and Cultus lakes, while the run to the Pemberton district was smaller than it has been for several years.

Before the fishing season of 1929 commenced, the upper fishing boundary on the Skeena was brought down three miles, thereby eliminating some of the most productive gill-net drifting grounds. This conservation measure undoubtedly had considerable effect on the escapement of salmon to the spawning grounds, which were as a whole abundantly seeded.

At Rivers Inlet fishing district, owing to the number of salmon gill-net licenses issued exceeding that for which a forty-eight hour close season was arranged, a sixty-hour close season was enforced from July 5 to August 2. This increased weekly close season, with the weather conditions that prevailed, tended to overcome the increased number of licences, and the spawning grounds of the district as a whole were well seeded; 484,245 cutthroat trout eyed eggs purchased from Mr. S. S. Drew, Montana, were planted out direct as follows: Sumas river, 25,000; Kanaka creek, 25,000; and Nicomekl river, 434,245.

The collections, distributions, etc., at the different hatcheries are dealt with more particularly in the following pages of this report.

FRASER RIVER WATERSHED

PITT LAKE HATCHERY

J. McIsaac, Superintendent

A heavy run of sockeye occurred in the Pitt Lake district, and in addition to a collection of 5,315,000 eggs the natural spawning grounds were very well seeded. The usual collecting grounds at Four Mile creek, Seven Mile creek, Ten Mile creek, Charles Peter creek and Mountain slough, were operated. Over 174,000 fry were reared to the No. 2 fingerling stage. The distribution of sockeye in 1929 from the previous autumn's collection of eggs amounted to 5,119,188, which is slightly larger than that of the previous year. The first and last eggs were respectively secured on September 2 and 26. The conditions at this hatchery permit of only one series of ponds, comprising an area of approximately 860 square feet. The location is quite unfavourable for further expansion, as the hatchery site, and its immediate neighbourhood, is very largely composed of rock boulders. With a view to decreasing the numbers of enemies and competitors to salmon and game fish, approximately 20,000 chub and suckers were destroyed by blasting in Blaney creek.

CULTUS LAKE AND SMITHS FALLS HATCHERIES

A. Robertson, Superintendent

The Cultus Lake hatchery is the headquarters for the sockeye salmon investigation in British Columbia. The actual fish cultural work is conducted by the hatchery staff, but in such a way as will best suit the program of research laid out by the Biological Board of Canada, and in accordance with the wishes of the resident investigators. In 1928 all the salmon run, nearly 15,000, were retained in Sweltzer creek, the outlet of Cultus lake; 32,656,624 sockeye eggs were secured, of which 2,506,000 were planted in the eyed stage in Dumville, Frost, Smiths Falls, East, West and Windfall creeks, which flow into the lake. Of this number 1,638,000 were planted in Frost creek. Unfortunately this creek ceased to run early in the summer, but as very few fry were to be seen when this occurred, it was assumed that the majority had safely reached the lake. The escapement from the other creeks is reported to have been all that could be desired.

Sockeye made their appearance very slowly during the autumn of 1929, and although a moderate run was expected it was not until November 25 that the number of fish in the enclosures assured a fair collection of eggs. The late arrival of the fish is largely attributed to the low state of the water in Sweltzer

creek. There was little or no rain throughout the spawning season, and it was not until December 25 that the slightest rise occurred in the level of the water in Cultus lake. The total number of sockeye handled was 4,909 (4,449 stripped), as compared with 5,415 in 1925, the preceding cycle year. In 1925, however, the fish were liberated above the fences, and allowed to ripen and spawn naturally in the lake and in its tributary streams. They were lifted over the fences on their first appearance, and under these circumstances the loss through fish dropping back, or dying unnoticed, would readily account for the difference of 506 had the 1925 run been held as they were in 1929. Of the total sockeye handled 382 females and 95 males were found dead on the fences. In previous years all the males found dead on the fences were considered a loss, chargeable to fish cultural operations, regardless of whether they had been stripped or not. This year every male used was marked by the removal of the top of the dorsal fin, and such of these fish as were found dead on the fences were counted as having been spawned; 11,113,285 sockeye eggs were secured, the first on October 30, 1929, and the last on January 8, 1930, a period of ten weeks; 10,090,260 eggs were secured by the ordinary expression method; the fish were then killed, bled, split, and over 1,023,025 additional eggs secured.

With a view to gaining information with regard to the possible injury and loss caused by the long retention of the early run fish, 86 were marked prior to October 15 by the removal of the top corner of the tail fin. The late arrival of the fish, attributed to the low water, prevented more extensive marking, and the possible securing of more conclusive data. Only 39 of the 86 marked fish were recaptured, the discrepancy being due to the fish drifting downstream and the obliteration of the mark through natural decay. Of the 39 recovered 23 were females and 16 males. One female and five males died on the fences unspawned. Five females were spawned unnoticed with the ordinary fish, and 17 females and 11 males were spawned separately, and their eggs held for comparison with the others.

The run of steelhead in Sweltzer creek was light, and only 38,500 such eggs were taken. This collection was augmented by 25,000 from the Cowichan Lake hatchery, and 25,000 from the Bureau of Fish Culture, Division of Fish and Game, Department of Natural Resources of California, in exchange for Atlantic salmon eggs. The resultant fry, 78,652, were retained and fed until they had attained an average length of one and one-half inches, and were distributed in Sweltzer creek and Vedder river.

The late summer and autumn of 1929 were the driest since fish cultural operations were commenced in the district, and the main hatchery at Cultus lake was greatly handicapped through a shortage of water. It was for some time feared that the eggs would have to be transferred to the hatchery buildings at Harrison lake and Smiths Falls. One million and one thousand of the sockeye eggs collected in 1928 were planted in an eyed stage in Eagle river, approximately 300 miles further up the Fraser river than the point where the eggs were collected. With a view to decreasing competitors and possible enemies of the sockeye, 875 suckers, averaging one pound each, were destroyed by the hatchery staff. A good run of coho reached the traps on Christmas day, and were dipped over the fences into the lake after 246,000 eggs were secured. A small number of chum salmon eggs, viz., 35,000, were also taken. One hundred and ninety-one thousand sockeye eggs from Harrison lake were laid down in Cultus Lake hatchery during the autumn for hatching purposes. The resultant fry will be taken back to Harrison for distribution. The requirements of the biological Board, University of British Columbia, and Hastings park aquarium, in the way of sockeye salmon and eggs, which amounted to over 535,000, were supplied from this establishment. Outgoing shipments of sockeye eggs amounted to 7,602,400 for Harrison lake, and 1,001,000 for Pemberton. Cultus in 1929 distributed 4,045,060 sockeye and 78,652 steelhead salmon.

HARRISON LAKE HATCHERY

E. V. Epps, Officer in Charge

In the autumn of 1928 the Harrison Lake hatchery was temporarily refitted to take care of eggs collected at Cultus Lake in excess of the capacity of the hatcheries at that place. During the autumn of 1928, 17,988,050 sockeye eggs were transferred to Harrison lake from Cultus lake, and in the winter following a further transfer of 7,602,400 was made from the same source. Of the total 25,590,450 Cultus Lake eggs handled at Harrison lake, 15,036,000 were planted in Eagle river and 602,000 in Salmon river in the Shuswap Lakes district. The balance of 8,562,000 were planted in the Harrison Lake district, including Morris creek, making a total distribution of 24,200,000 sockeye. During the autumn of 1929 preparations were made to collect sockeye eggs in Hatchery and Trout creeks at the Harrison Lake hatchery. The season was extremely dry with no visible flow in Trout creek. Consequently very few sockeye made their appearance and the total collection in that area was 191,000 sockeye eggs which were transferred to the Cultus Lake hatchery. These eggs will, however, be retransferred to Harrison lake as only the sockeye native to Cultus lake are being distributed in Cultus waters.

PEMBERTON HATCHERY

T. W. Graham, Superintendent

In June this hatchery received 30,000 Kamloops trout eyed eggs from Lloyd's Creek hatchery, and in July, 25,000 of the same species from Penask lake. Low water conditions were experienced in the Birkenhead river, where the supply of sockeye eggs for this establishment are secured, and the run of salmon was not up to the average of recent years, the collection of 18,000,000 being the smallest since 1918, although it is estimated that 95 per cent of the sockeye were spawned. In February, 1929, 1,001,000 sockeye salmon eyed eggs were received from Cultus lake. From these and the eggs carried over from 1928, 2,380,000 fry and 300,000 eggs were distributed in Gates lake and creek and Anderson lake at the head of the Anderson-Seton Lakes system.

PENASK LAKE HATCHERY

A. P. Hills, Officer in Charge

Experimental egg collections begun in 1928 for the purpose of ascertaining the available supplies of Kamloops eggs in Penask and adjoining lakes, were continued in 1929. The lake was reached on April 29, when parts of Penask creek were still frozen over. A fence was placed in Penask creek on May 3, it being necessary to cut the ice out of the creek. Ice did not break up on the lake until May 17, and on that date a fence was placed in Spahomin creek, the outlet of the lake. A number of fish had previously passed down the creek through the spawning grounds, and only a small collection was made at this point. A few fish were observed in Penask creek on May 19 and on the 20th approximately two hundred entered the trap, but were in a very immature condition. The trap was consequently closed and re-opened on May 24, when over four thousand fish entered it within three hours, none of which were in a spawning condition. Fish eggs were collected in Spahomin creek on May 24 and in Penask creek on June 10. The eggs were eyed in baskets placed in floating racks in Penask creek, and a small number in the ordinary shipping trays, which were also stacked and held in the racks. Approximately seventy-five per cent of the eggs collected in Penask creek were taken at a point some three miles from the lake, as the majority of those fish that reached the main

trap, one mile from the lake, were in a very green condition. It is estimated that the enormous number of approximately fifty to sixty thousand Kamloops trout ascended Penask creek. A heavy toll was, however, taken by the local Indians for food purposes. Spahomin creek supplied 53,000 and Penask creek 1,217,000 eggs, making a total of 1,270,000 Kamloops trout eggs which completely filled all the hatching equipment on the ground. In view of the season's experience a permanent camp was established and a hatchery building, with accommodation for the staff constructed. This hatchery building, fifty feet by twenty-two feet, with open sides and ends, has accommodation for thirty-two hatching troughs in eight clusters of four each. Each trough is sixteen feet long, ten and one-half inches wide, and six and one-half inches deep. The living quarters are thirty feet by twenty feet inside measurement, divided into a living room and four bedrooms. The water is carried to the hatchery by an eight hundred foot flume, leading from a shallow dam in Penask creek. The living quarters are of log construction. All logs, sills, etc., were cut on the site. Penask shipped to Cowichan Lake hatchery 2,000 eyed Kamloops eggs, to Pemberton 25,000, and to Summerland 464,855. It also sold to Sunnyside hatchery 25,000 Kamloops eggs. The local distribution amounted to 718,778 Kamloops.

LLOYD'S CREEK HATCHERY

G. J. Morgan, Officer in Charge

Owing to the exceptionally light snowfall in the district during the previous winter, and consequently small run-off, the creeks were at a very low stage during egg collecting operations. An average run of Kamloops trout occurred at Paul creek, but there was not sufficient water to enable the trout to ascend to the traps in any numbers. The lower reaches of the creek were abundantly seeded, but a collection of only 182,000 Kamloops trout eggs was made where formerly the greater portion of the eggs secured for this station were collected. The run at Pinantan creek was well up to the average and the collection amounted to 966,000 Kamloops trout eggs, more than double the collection of the previous year. Hyas Long lake collection was disappointing owing to unfavourable water conditions during which the trout did not school to any extent at the outlet of the lake where it would have been feasible to secure them, but spawned along the beaches over a considerable area. The collection amounted to only 87,500 Kamloops trout eggs. One hundred and thirty thousand eggs were collected at the request of the Forestry Branch of the Department of the Interior at Fish lake and planted in a green state in a ditch previously prepared for their reception. One hundred and thirty thousand were also collected at this point and laid down in Lloyd's Creek hatchery. The total collection in the district amounted to 1,495,500 Kamloops trout eggs, which gave a distribution of 1,130,100 eggs and fry including 50,000 sold to private hatcheries (Ewing's hatchery 20,000, Sunnyside hatchery 30,000) and 100,000 to the Fisheries Experimental Station, Archi-Ken, Japan, but exclusive of shipments of 125,000 eyed eggs to Lakelse Lake hatchery, 75,000 to Nelson hatchery, 30,000 to Pemberton hatchery and 75,000 to Cranbrook Trout club, this latter in exchange for cutthroat trout.

SQUILAX EGG COLLECTING CAMP

J. W. Dalzell, Officer in Charge

Five hundred and five thousand sockeye salmon eggs were collected in Adams river, Shuswap lake, and transferred to the Experimental station operated by the Biological Board at Taft on Eagle river. These eggs are being used by the board in connection with its investigation into the results that may

be expected from the stocking of suitable, but at present barren, areas of the Fraser river with eggs and fry from other parts of the same system. An inspection of Little river, Adams river and Scotch creek was begun on September 4 by G. J. Morgan, but no sockeye were observed and conditions were found to be most unfavourable in Scotch creek, the water being extremely low throughout, and only more or less stagnant pools being found in the creek for over a mile from its outlet into the lake. A few sockeye were reported as being in the creek about three miles from its mouth in August before the water had receded. Apart from a few dozen fish observed at Adams river and Scotch creek the main run did not make its appearance in this district until October 14, when large numbers were seen in both Adams and Little rivers. The great majority of the fish were males with a corresponding shortage of females and considerable difficulty was experienced in getting the eggs desired.

STUART LAKE HATCHERY

H. C. Crawford, Superintendent

Crawford and Rainbow lakes which have been used as natural retaining ponds or nurseries for fry were not planted in the spring of 1929 because numbers of sockeye planted there in previous years did not migrate as yearlings but became land-locked. These land-locked fish have proven exceptions to the generally accepted belief that sockeye must go to sea before they reproduce, and also that sockeye die after their first spawning. During 1929, 69,000 sockeye eggs were collected from Crawford and Rainbow lake fish. These fish had never left the lake, since the outlet stream is so precipitous that it is impossible for salmon to ascend it from the lower level. Crawford lake, which is about 730 yards long, 280 yards wide and 33 feet deep, had been found teeming with natural fish food but barren of fish. It was planted with sockeye fry for the first time in 1921. Most of the fish from this distribution left the lake of their own accord about the middle of May and the middle of June, 1922, when they ranged from $3\frac{1}{2}$ to $5\frac{1}{2}$ inches in length. Fry planted in 1922 averaged about 2 inches in length in June of that year and in the following year they migrated in very large numbers. In 1924 equally favourable results were observed, though the average size of the fish was, if anything, larger than in previous years. In 1925, when migration started on May 17, the fish were apparently of rather smaller size than in former years, but at the same time a small percentage of larger-than-average size fish were observed and were considered to be two-year olds. Two distinct sizes were noticed—one averaging $4\frac{1}{2}$ inches and the other 7 inches. This was the first time that fish of this larger size had been seen among the migrants from Crawford lake. A small percentage of fingerlings or fish in their first year was noticed each season in the general migration, but in 1926, such fish were present in greater numbers than usual. In the following year an increase was observed in the number of large fish, two-year olds, and a decrease in the general run. Practically no migration of yearling sockeye was observed in 1928, and it was decided to discontinue further stocking for a period of three years. In the autumn of 1928 a test net was set and 20 sockeye ranging from two-year olds to mature land-locked fish carrying eggs were caught in one night. The collection of land-locked sockeye eggs was undertaken in the autumn of 1929. Four hundred and ninety-six fish were caught. The females, most of them ripe when taken, greatly out-numbered the males. Out of 307 fish up to September 4, only 36 were males. The spawners were a dirty greyish green on the back and sides and a mottled grey underneath. The fish containing immature eggs were a bright silvery colour. Unlike sockeye that return from the sea, these land-locked fish did not turn red. The eggs collected were of poor quality, a condition partly attributed to the scarcity of males and the manner in which the fish had to be taken, namely, in gill-nets. In order to

further test the theory that all sockeye die after their first spawning, 7 spawned fish were placed in pens and kept under observation for a period of two weeks. At the end of that period they were in a better and more vigorous condition than they were when first placed in the retainers. In the spring of 1929, 4,100 sockeye yearlings were marked by the removal of the adipose and the posterior half of the dorsal fins. One thousand marked between May 6 and 8 were migrants from Rainbow lake and 3,100 marked between May 14 and 15 were migrants from Alexander lake. The migration of yearling sockeye from Alexander lake during the month of May was estimated between 80,000 and 100,000. Efforts are being made to decrease the numbers of land-locked sockeye in Crawford and Rainbow lakes with a view to restoring these lakes to their former condition as excellent natural retaining ponds, and with this end in view, 496 such fish were netted and removed from the former and 1,078 from the latter.

The run of sockeye to the Stuart lake district in the autumn of 1929 was the largest since that of 1909. The first sockeye was caught at the entrance to the lake on July 17, the run passing through Stuart lake and up Tatche river. No sockeye appeared in Souche or Pinche creeks where a collection of eggs could possibly be made. Three million two hundred thousand sockeye fry hatched from the collection of 1928 were distributed in Stuart, Cunningham and Grass lakes. Fourteen thousand one hundred and fifty land-locked sockeye, eggs and fry from the 1929 collection were planted in Cunningham creek. The Fishery Guardian for the district reports that two distinct runs of sockeye occurred in 1929, the first covering the period between July 17 and August 31, and the second starting about September 25 and continuing until about October 3; that the fish on the first run reached the lake in splendid physical condition, but that those of the second run were quite the reverse, many being so spent and exhausted that they could not reach the spawning creeks in the upper watershed but spawned in Stuart river, and along with the lake trout around the islands and on the south shore of Stuart lake.

General repairs were effected, including the construction of a new water supply dam, the cutting of a channel through a large log jam in Hoy creek in Middle river, cleaning the outlet streams from Waterlilly, Grass and Rainbow lakes, and the opening up and deepening of portions of the outlet of Crawford lake.

MAINLAND WEST COAST

RIVERS INLET HATCHERY

F. A. Tingley, Superintendent

The spawning grounds in the Owikeno Lake area as a whole were well seeded by natural spawning. A heavy run of sockeye occurred in Wauquash and Dallick rivers. There were good runs in Indian, Cheo, Shumahalt and Nookins rivers. Quap and Genesi creeks were fairly well seeded by the fish that escaped over and around the hatchery fences during the freshet on October 16, and from those that remained to ascend after the fences were removed. There was also a good run in the hatchery (Meadowse) creek, though the spawning area is small. Asklum creek carried a light run.

The freshet in October, although heavy, was early in the season and of short duration, and does not appear to have caused unusual damage to the spawning grounds. The heaviest freshet of the season usually occurs late in December or early in January. In 1929 while there was heavy rain in December, the temperature was sufficiently low to make snow in the higher levels and the streams were not extremely high. Up to the end of the year, Superintendent Tingley is of the opinion that the condition of the spawning grounds was better than usual so far as they were affected by freshets. The run to Quap creek commenced unusually early, 320,000 eggs being taken at the first spawning on

September 17. The collection was completed at this point on November 7 with a total of 15,580,000 sockeye eggs. The collection at Genesi creek totalled 4,494,000 sockeye eggs, the first spawning being done on October 3, and the last on November 4. At Quap, 5,040 females and 2,085 males were used; and at Genesi, 1,465 females and 630 males; a total of 6,505 females and 2,715 males for the district. Total collection for the season was 20,074,000 sockeye eggs.

From the 1928 collection 4,936,000 eyed sockeye eggs and 8,679,046 sockeye fingerlings were distributed in Owikeno lake and its tributaries in 1929; 240,000 eyed eggs were also planted in Genesi creek from the 1929 collection, making a total distribution for the year of 13,855,046 sockeye.

That the eyed sockeye eggs that were planted in the small stream flowing into Walkus lake in 1922 have survived and reproduced was evidenced by the appearance of sockeye of small size, mostly males in an advanced stage of development in different parts of the lake last autumn. The outlet stream of this lake goes over a high fall, making it quite impossible for fish from the lower levels to surmount, consequently the spawning fish observed must have been the result of the egg planting referred to.

SKEENA RIVER WATERSHED

LAKELSE LAKE HATCHERY

C. R. T. Hearn, Superintendent

The whole of the retaining pond system was thoroughly cleaned out and the sections in which the heaviest losses had occurred the previous year were heavily sown with salt for disinfection purposes, the salt being left in them during the winter. The ponds at this plant are in three series in old water channels containing respectively 2,490, 4,560 and 2,550 square feet, or a total pond area of 9,600 square feet. The fingerling production compared very favourably with that of previous years, the size attained at time of distribution when little over seven months old being three inches long and three-quarters of an inch deep. Practically the only artificial food used was halibut meal which at this point at least gives every satisfaction. Seven hundred and twenty-eight thousand fry were transferred to the pond on April 1 and a further 26,000 on April 8. Two hundred and fifty thousand fingerlings were distributed on May 10 and a further 200,000 on the 5th, 7th and 8th of June, the loss up to that date being less than one per cent. The final distribution was made on September 26. The conditions on the spawning grounds of the important tributaries of Lakelse lake were quite favourable during the early part of the season but three serious freshets occurred, as severe as that experienced in 1925, on October 12 and on the 13 and 28 of November. These freshets were so severe and did so much damage to the spawning grounds that only meagre results may reasonably be expected from the natural seeding that took place in the larger and more important tributaries of the lake. The run of sockeye to this system was fairly good, comparing favourably with that of the cycle year 1925 in which it will be remembered two very severe freshets were experienced in November and December, causing extensive and serious damage to the spawning beds of the two principal streams, viz., Williams and Scullabuchan. The run to the first mentioned was not as large as that of four years ago but the number of fish that returned to the latter was the largest during the past eight years. One hundred and twenty-five thousand Kamloops trout eyed eggs were received at this hatchery in June from Lloyd's Creek hatchery and were distributed in the Prince George, Prince Rupert and Smithers districts. General repairs were effected, including the construction of a fence in the main channel of Williams creek. Eight million one hundred and eighty-three thousand sockeye eggs were collected; 5,223,100 sockeye hatched from the collection of 1928 were distributed.

BABINE LAKE HATCHERY

R. H. Eaton, Superintendent

The run of sockeye through all parts of the Babine Lake area was exceptionally good, and all such areas were well seeded naturally in 1929. The fish on an average were of good size, and the runts (small males) were relatively scarce in comparison with last year. The collection of eggs was begun in Morrison creek on September 9; 1,063 females and 955 males were stripped at the hatchery yielding 3,000,000 sockeye eggs; 4,830,000 were also secured at the lower fences between September 10 and September 21 from 1,691 females and 1,462 males, making the total collection of sockeye eggs 7,830,000. In addition to this collection the spawning grounds of the creek were very heavily seeded. An unusual run of sockeye fingerlings averaging 2 inches in length were observed in Morrison creek during the latter part of July and the early part of August. The migration of yearling sockeye in the creek was the largest in number and extended over a longer period than in any year since the appointment of the present superintendent. The first yearlings were observed on May 5 and the last on June 4. A series of leaks occurred in the dams of the retaining ponds which permitted the escape of most of the fry retained therein to Morrison creek. On August 16 and 17, 1,045 No. 2 fingerlings were marked by the removal of adipose fin and liberated in Morrison creek. The Superintendent reports that when the collection of eggs was completed more sockeye were in the creek than when the collection started. Seven hundred and eighty thousand eggs were secured by incision after the fish had been spawned in the usual way. Extensive repairs were completed by the staff during the summer, including the renewal of the hatching troughs and the construction of a boathouse 16 feet wide, 36 feet long and 13 feet high to the plate, with marine ways 110 feet long. The boathouse is constructed of spruce logs with a spruce shake roof. The marine ways with cradle and capstan fill a long-felt want and enable two men to house the launches as desired.

This hatchery suffered a severe loss in the person of Mr. W. R. Johnston, its oldest employee, who was accidentally killed when returning from his annual leave on September 2.

A distribution of 7,754,521 sockeye eggs, fry and fingerlings was made from the egg collection of 1928.

VANCOUVER ISLAND

ANDERSON LAKE HATCHERY

David Bothwell, Superintendent

A long period of frosty weather without rain or snow was experienced during January and February, 1929. These conditions were accompanied by an extremely low stage of water in many of the creeks, which in some instances caused a heavy loss in eggs. The first sockeye eggs were collected and placed in the hatchery troughs on October 19, 1929. Collecting operations were continued until October 31. During this period 6,153,000 eggs were taken. An interval of seventeen days was allowed to elapse before egg collecting was resumed on November 18. On this and the following day, November 19, 2,352,000 were secured, making a total of 8,505,000 sockeye eggs for the season. The most favourable spawning conditions prevailed throughout the whole spawning season that the superintendent has observed during his nineteen years at this station. No freshets occurred, low water conditions prevailed, and all spawning grounds were heavily seeded, the most serious damage being caused by spawning fish uncovering the eggs of the early spawners. Forty per cent of the fish spawned in Clemens Creek and approximately sixty per cent of the spawning took place on the beaches of the lake. The low water conditions above mentioned continued into the winter and serious losses were caused by the eggs being frozen.

The number of sockeye that reached the spawning grounds in 1929 is estimated at 135,000, the largest number observed in the experience of the present Superintendent and nearly double the estimated number for the preceding year.

Facilities were provided for the planting of sockeye eggs in Maggie lake and its tributaries with a view to establishing a seasonal run to this body of water. A cabin was built of logs with shake roof with a six foot verandah or overhang of the roof. The building inside is 18 feet 6 inches by 13 feet 4 inches, with shiplap floor and door. It is about 100 feet from the edge of the lake on a small bench above high water mark. Maggie lake is situated about forty miles below Port Alberni, and about two and one-half miles from Alberni canal on the north shore. It is $2\frac{1}{2}$ miles in length with an average width of one-half mile. The greater part of the lake is fairly deep with a good proportion covered with aquatic vegetation. It has two inlet streams which provide favourable planting areas for the eggs. The only unfavourable feature appears to be a fall of about fifteen feet in height in the outlet stream about $1\frac{1}{2}$ miles below the lake. This fall is a complete barrier to the ascent of salmon, but should the species be successfully established a fishway can be constructed at small expense on a small channel adjacent to the main stream. The first planting of sockeye eggs (1,001,000) was made in December, 1929, from this year's collection.

Some repairs were made during the year including foundation posts, hewn cedar sills for the main hatchery building, and 100 feet of water supply flume. A distribution of 8,787,881 sockeye eggs and fry was made during 1929, 6,281,881 of which were from eggs collected in 1928, and 2,506,000 from the collection of 1929.

COWICHAN LAKE HATCHERY

J. H. Castley, Superintendent

Low water conditions at Skutz falls on the Cowichan river presented a serious barrier to the ascent of salmon to the upper reaches of the river, and consequently interfered greatly with the collection of such eggs. For this reason the fall run of spring salmon was practically a failure, but a small freshet early in October permitted a few fish to get past the falls. These were in a badly battered condition when they reached the hatchery nets and the eggs secured from them were consequently of poor quality. The spawning grounds on the upper part of the river were for the same reason poorly seeded with salmon eggs. The same conditions also interfered with the coho collection. The run was small and many of the fish taken in November were not only badly battered but also covered with fungus. On November 10, fishing operations for coho were suspended, but following a rise in the river, fishing was resumed on November 14 and continued until December 23, when there was a fair average run of this species, which was maintained until the end of the year. Nine hundred and twelve thousand two hundred coho eggs were taken. The natural seeding of this species was a good average. Fishing for parent steelhead in the Cowichan river was abandoned on account of low water and zero weather on January 29, but was resumed on February 13 and continued until February 28. Eight thousand two hundred eggs were also taken on April 6 in Nuttall creek, making the total collection of steelhead salmon eggs 137,900. The collection of cutthroat trout eggs was commenced on February 24, with the termination of the main steelhead operations, and continued until March 29, with a collection of 201,200, which was somewhat greater than the previous season. Twenty-five thousand eyed eggs of this species were received from Cranbrook hatchery in June, 1929. Spring salmon operations began on October 14 and continued until November 11, with a take of 432,000 eggs, which was considerably smaller than the collection of the previous year. A collection of 56,000 speckled trout eggs was made in Spectacle lake and 194,000 from the hatchery ponds. The collection at the first mentioned place was also greatly hampered by low water. Two thousand Kamloops trout eyed eggs were received in July from Penask

Lake hatchery. Twenty-five thousand steelhead eggs were shipped to Cultus in April. Trout fishing in the Cowichan river was very good. Excellent sport was obtained in the early months, as well as during September and October. Land-locked sockeye (Kokanee or little Red fish) were observed for the first time by the hatchery staff in Cowichan lake. General repairs were effected, including repairs to the hatchery dam, new spillway, and new floats (logs) under the old boat house, which was towed up the river to the foot of the lake, where it gave shelter for the hatchery launch during the summer months, when the water is too low in the river to admit of the boat being taken to the hatchery.

The total distribution from Cowichan lake hatchery for the season was 1,971,746 made up by species as follows: cutthroat trout 212,324, speckled trout 126,250, spring salmon 1,535,280 and steelhead 97,892.

KENNEDY LAKE HATCHERY

W. P. Forsythe, Superintendent

A distribution of 2,560,159 sockeye was made in 1929 from the 1928 collection. None of these were released direct from the hatching troughs. All were transferred to retaining ponds when they reached the free-swimming stage, and were released from the ponds as was necessary to prevent overcrowding. All of the season's output was retained and fed in the ponds for from two to three weeks. To the No. 1 fingerling stage they were fed halibut meal, and subsequently halibut meal and whale meat, but after the No. 4 fingerling stage was reached whale meat only was used. Some of the fingerlings were five inches in length before they were liberated. Eleven retaining ponds were in operation during the season. Two more are under construction, which when completed will give a total pond area of 6,678 square feet. The early June run of sockeye, which spawn in late August and early September, was better than usual. Three hundred and ninety-seven thousand such eggs were secured between September 3 and 25. In addition some natural spawning took place, under splendid conditions, and one portion of the Clayoquot river was heavily seeded in this way. The eggs from this early run commenced hatching on November 12, only sixty-nine days after they were taken. The fall run of sockeye to Kennedy lake was estimated at fifteen thousand. The natural spawning grounds of Clayoquot arm and Cold creek were well seeded. The return to the Upper Clayoquot river was also much better than usual, but that to Elk lake was poor. Muriel lake had a run of from two to three thousand fish. This lake has been inspected each season during the last twelve years, with the exception of 1928, and never more than from ten to fifteen sockeye were observed, as against two to three thousand in 1929. This improved and larger run appeared when the fish resulting from egg planting from the hatchery were due to return.

Conditions were very favourable for natural spawning throughout the spawning season, and up to the end of the year. The collection of eggs from the late run commenced on October 29 and finished on November 26. Seven million four hundred and ninety-two thousand sockeye eggs were secured for the whole season, as compared with two million eight hundred thousand in 1928, and three million three hundred thousand in 1927.

SOUTHERN INTERIOR

NELSON HATCHERY

Weldon Reid, Superintendent

Four hundred and ninety-four thousand eight hundred rainbow trout, one million two hundred and ninety-one thousand eight hundred and twenty speckled trout and four hundred and ninety-seven thousand four hundred and forty-eight

Kokanee salmon (little red fish) eggs were collected in 1929 for the Nelson hatchery. The rainbow trout eggs were secured during May and June in Cottonwood and Six Mile lakes. The speckled trout eggs were obtained as follows: nine hundred and five thousand seven hundred and forty in Boundary lake, and three hundred and eighty-six thousand and eighty in Violin lake in October and November. The speckled trout collection was almost double that of the previous year. Little red fish were obtained in Kokanee and Red Fish creeks, Kootenay lake. The collection of this species was also double that of 1928. Local collections were supplemented by shipments of Kamloops trout eggs from Lloyd's creek and Gerrard hatcheries of 75,000 and 500,000 respectively. Nelson shipped Summerland in February 107,500 speckled trout eyed eggs. It also supplied Cranbrook Trout Club with 50,000 Kamloops eggs in exchange for cutthroat trout eggs. The total distribution from this hatchery for 1929 was 1,596,211 by species as follows: Kamloops trout, 479,215; Rainbow trout, 460,589; speckled trout, 392,407; and Kennerly's salmon, 264,000.

GERRARD HATCHERY

Weldon Reid, Superintendent

The Gerrard is subsidiary to the Nelson establishment, and confines its operations to the propagation of Kamloops trout. Spawning operations extended from May 5 to 24 inclusive, during which period four hundred and fifty-nine fish were handled, and one million eight thousand eggs secured. This collection is almost double that of each of the two previous seasons. It shipped 500,000 Kamloops eggs to Nelson and also made a distribution of 446,913 Kamloops fry.

SUMMERLAND HATCHERY

G. N. Gartrell, Fisheries Inspector

The Summerland hatchery, under the general direction of Fisheries Inspector Gartrell, makes no independent collection, but secures its eggs from other sources. During 1929 it received 5,000,000 whitefish eggs from Fort Qu'Appelle hatchery, Saskatchewan, 107,500 speckled trout eggs from Nelson, and 464,855 Kamloops trout eggs from Penask lake. Its total distribution of all species for the season was 5,238,200, made up as follows: Kamloops trout, 450,850; speckled trout, 107,350; and whitefish, 4,680,000.

CRANBROOK HATCHERY

H. J. Ryder, Officer in Charge

The Cranbrook hatchery was built and is maintained by various local organizations. The department each season loans an experienced hatchery officer, has loaned certain equipment, and contributes to the extent of \$300 towards the cost of egg collection. The distribution of the output is under the direction of the department, and not more than twenty-five per cent is distributed outside of the Cranbrook district. Its operations have been transacted with splendid success since its establishment. In 1929, one million and eighty-four thousand cutthroat trout eggs were collected in Fish lake, forty-six thousand in Mineral lake, three hundred and forty-seven thousand in Munroe lake and sixty-one thousand in Peavine creek, making a splendid total for the season of one million five hundred and thirty-eight thousand. Thirty-three thousand Cranbrook trout eggs were secured in Munroe lake. Local collections were supplemented by fifty thousand Kamloops trout eggs from the Nelson and seventy-five thousand from Lloyd's creek hatchery. The total distribution for the season was one million four hundred and ninety-eight thousand, three hundred and eighty-nine and by species as follows: 1,348,314 cutthroat trout, 121,925 Kamloops trout, and 28,150 Cranbrook trout.

THE FOLLOWING TABLE SHOWS BY SPECIES THE LOCAL COLLECTIONS OF EGGS MADE DURING 1929, THE POINT WHERE SUCH EGGS WERE TAKEN AND HATCHERY IN WHICH THE EGGS WERE LAID DOWN, WITH NUMBERS LAID DOWN IN EACH CASE.

Species	Collection Area	Number collected	Laid down in	Number laid down	Subtotals	Totals
Atlantic salmon.....	Margaree Pond, Margaree Harbour, N.S.....	1,998,534	Margaree hatchery.....	1,998,534	1,998,534	
	River Philip, Cumberland county, N.S.....	3,132,690	Antigonish hatchery.....	1,490,300	1,490,300	
	Allen's lake, Yarmouth county, N.S.....	74,500	Bedford hatchery.....	1,642,390	1,642,390	
	Miramichi pond, South Esk, N.B.....	14,410,663	Yarmouth hatchery.....	74,500		
			Yarmouth hatchery.....	1,998,356	2,072,856	
			Miramichi hatchery.....	10,458,607	10,458,607	
			Middleton hatchery.....	1,953,700	1,953,700	
	New Mills Pond, New Mills, N.B.....	1,635,300	Restigouche hatchery.....	1,635,300		
	Matapedia river, Matapedia county, Que.....	501,465	Restigouche hatchery.....	501,465	2,136,765	
	St. John Pond, Little river, N.B.....	6,268,300	Florenceville hatchery.....	2,135,500	2,135,500	
			Grand Falls hatchery.....	3,078,600	3,078,600	
			St. John hatchery.....	1,054,200	1,054,200	
Speckled trout.....	Morell river, Kings county, P.E.I.....	833,800	Kelly's Pond hatchery.....	833,800	833,800	28,855,252
	Lochaber lake, Antigonish county, N.S.....	264,100	Kelly's Pond hatchery.....	264,100		
	Antigonish hatchery ponds, Antigonish county, N.S.....	50,571	Antigonish hatchery.....	50,571	314,671	
	Margaree hatchery ponds, N.E. Margaree, N.S.....	106,855	Antigonish hatchery.....	106,855		
	Pollett's cove, Pleasant Bay, N.S.....	53,987	Margaree hatchery.....	66,680		
	Pond river, Pleasant bay, N.S.....	45,750	Margaree hatchery.....	53,987	273,272	
	Red river, Pleasant Bay, N.S.....	45,750	Margaree hatchery.....	45,750	4,100	
	Yarmouth hatchery ponds, Yarmouth county, N.S.....	(a) 568,631	Florenceville hatchery.....	4,100	568,631	
	Florenceville hatchery ponds, Florenceville, N.B.....	1,183,402	St. John hatchery.....	568,631		
	St. John hatchery ponds, St. John, N.B.....	46,079	Kelly's Pond hatchery.....	1,183,402	1,183,402	
	Kelly's Pond hatchery ponds, P.E.I.....	123,037	Kelly's Pond hatchery.....	46,079		
	Blooming Point Pond (McCormick's stream), P.E.I.....	33,894	Kelly's Pond hatchery.....	123,037		
	Gillan's stream, P.E.I.....	33,894	Kelly's Pond hatchery.....	33,894		
	Essory's stream, P.E.I.....	63,055	Kelly's Pond hatchery.....	63,055		
	Ing's Pond, P.E.I.....	61,541	Kelly's Pond hatchery.....	61,541		
	McKinnon's stream (McNeil's), P.E.I.....	3,444	Kelly's Pond hatchery.....	3,444		
	Morell river, P.E.I.....	17,200	Kelly's Pond hatchery.....	3,444	351,977	
	Watts stream, P.E.I.....	194,000	Cowichan lake hatchery.....	17,200		
	Cowichan hatchery ponds, Vancouver island, B.C.....	56,000	Cowichan lake hatchery.....	194,000		
	Spectacle lake, Vancouver island, B.C.....	905,740	Nelson hatchery.....	56,000	250,000	
	Boundary lake, near Nelson, B.C.....	386,080	Nelson hatchery.....	905,740		
	Violin lake, near Nelson, B.C.....	84,000	Nelson hatchery.....	386,080		
Landlocked salmon.....	Chamcook lakes, N.B.....	75,150,000	St. John hatchery.....	84,000	1,291,820	4,237,873
	Dauphin river, Lake Winnipeg, Man.....	1,800,000	Gull Harbour hatchery.....	84,000	84,000	
	Pigeon bay, Lake Winnipeg, Man.....	1,800,000	Pigeon Bay.....	75,150,000	75,150,000	
	Waterhen river, Lake Winnipegosis, Man.....	106,315,000	Winnipegosis hatchery.....	1,800,000	1,800,000	
			Fort Qu'Appelle hatchery.....	86,315,000	86,315,000	
Whitefish.....				20,000,000		84,000

Jackfish-Murray lakes, McIntosh creek, Sask.	63, 687, 000	Fort Qu'Appelle hatchery... Jackfish lake, Sask. Cochin creek... Murray lake... Lesser Slave lake hatchery... Lesser Slave lake hatchery... Lesser Slave lake hatchery... Gull Harbour hatchery... Swan Creek hatchery... Swan creek... Marsh Point creek... Murray lake... Fort Qu'Appelle hatchery... Fort Qu'Appelle hatchery... Lesser Slave lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Cultus lake hatchery... Smiths Falls hatchery... Pemberton hatchery... Biological Board... Stuart lake hatchery... Stuart lake hatchery... Rivers inlet hatchery... Rivers inlet hatchery... Lakelse lake hatchery... Lakelse lake hatchery... Lakelse lake hatchery... Babine lake hatchery... Kennedy lake hatchery... Kennedy lake hatchery... Spray lakes hatchery... Cowichan lake hatchery... Cowichan lake hatchery... Gerrard hatchery... Fish lake, B.C. Lloyd's creek hatchery... Lloyd's creek hatchery... Lloyd's creek hatchery... Penask lake hatchery... Penask lake hatchery... Penask lake hatchery... Yarmouth hatchery... St. John hatchery	21, 322, 000 24, 275, 000 13, 300, 000 4, 750, 000 43, 278, 000 18, 380, 000 48, 895, 000 7, 650, 000 169, 830, 000 75, 820, 000 8, 160, 000 24, 055, 000 43, 010, 000 11, 690, 000 58, 125, 000 308, 000 689, 000 154, 000 1, 665, 000 2, 499, 000 191, 000 4, 506, 160 6, 607, 125 18, 000, 000 505, 000 (b) 41, 000 (b) 28, 000 4, 494, 000 15, 580, 000 126, 000 3, 911, 000 4, 146, 000 7, 830, 000 8, 505, 000 7, 492, 000 505, 105 54, 000 108, 500 38, 700 1, 008, 000 260, 000 182, 000 966, 000 87, 500 1, 217, 000 53, 000 2, 050 251, 986	41, 362, 000 24, 275, 000 13, 300, 000 4, 750, 000 110, 553, 000 7, 650, 000 169, 830, 000 75, 820, 000 8, 160, 000 24, 055, 000 43, 010, 000 11, 690, 000 58, 125, 000 308, 340, 000 689, 000 154, 000 1, 665, 000 2, 499, 000 191, 000 4, 506, 160 6, 607, 125 18, 000, 000 505, 000 (b) 41, 000 (b) 28, 000 4, 494, 000 15, 580, 000 126, 000 3, 911, 000 4, 146, 000 7, 830, 000 8, 505, 000 7, 492, 000 505, 105 54, 000 108, 500 38, 700 1, 008, 000 260, 000 182, 000 966, 000 87, 500 1, 217, 000 53, 000 2, 050 251, 986
Jackfish-Murray lakes, McIntosh creek, Sask.	63, 687, 000	Fort Qu'Appelle hatchery... Jackfish lake, Sask. Cochin creek... Murray lake... Lesser Slave lake hatchery... Lesser Slave lake hatchery... Lesser Slave lake hatchery... Gull Harbour hatchery... Swan Creek hatchery... Swan creek... Marsh Point creek... Murray lake... Fort Qu'Appelle hatchery... Fort Qu'Appelle hatchery... Lesser Slave lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Pitt lake hatchery... Cultus lake hatchery... Smiths Falls hatchery... Pemberton hatchery... Biological Board... Stuart lake hatchery... Stuart lake hatchery... Rivers inlet hatchery... Rivers inlet hatchery... Lakelse lake hatchery... Lakelse lake hatchery... Lakelse lake hatchery... Babine lake hatchery... Kennedy lake hatchery... Kennedy lake hatchery... Spray lakes hatchery... Cowichan lake hatchery... Cowichan lake hatchery... Gerrard hatchery... Fish lake, B.C. Lloyd's creek hatchery... Lloyd's creek hatchery... Lloyd's creek hatchery... Penask lake hatchery... Penask lake hatchery... Penask lake hatchery... Yarmouth hatchery... St. John hatchery	21, 322, 000 24, 275, 000 13, 300, 000 4, 750, 000 43, 278, 000 18, 380, 000 48, 895, 000 7, 650, 000 169, 830, 000 75, 820, 000 8, 160, 000 24, 055, 000 43, 010, 000 11, 690, 000 58, 125, 000 308, 000 689, 000 154, 000 1, 665, 000 2, 499, 000 191, 000 4, 506, 160 6, 607, 125 18, 000, 000 505, 000 (b) 41, 000 (b) 28, 000 4, 494, 000 15, 580, 000 126, 000 3, 911, 000 4, 146, 000 7, 830, 000 8, 505, 000 7, 492, 000 505, 105 54, 000 108, 500 38, 700 1, 008, 000 260, 000 182, 000 966, 000 87, 500 1, 217, 000 53, 000 2, 050 251, 986	41, 362, 000 24, 275, 000 13, 300, 000 4, 750, 000 110, 553, 000 7, 650, 000 169, 830, 000 75, 820, 000 8, 160, 000 24, 055, 000 43, 010, 000 11, 690, 000 58, 125, 000 308, 340, 000 689, 000 154, 000 1, 665, 000 2, 499, 000 191, 000 4, 506, 160 6, 607, 125 18, 000, 000 505, 000 (b) 41, 000 (b) 28, 000 4, 494, 000 15, 580, 000 126, 000 3, 911, 000 4, 146, 000 7, 830, 000 8, 505, 000 7, 492, 000 505, 105 54, 000 108, 500 38, 700 1, 008, 000 260, 000 182, 000 966, 000 87, 500 1, 217, 000 53, 000 2, 050 251, 986
Lesser Slave lake, Alta.	43, 278, 000	Lesser Slave lake hatchery...	43, 278, 000	
Mink Creek, Alta.	18, 380, 000	Lesser Slave lake hatchery...	18, 380, 000	
Whitfish river, Alta.	48, 895, 000	Lesser Slave lake hatchery...	48, 895, 000	
The Quarry, Lake Winnipeg, Man.	7, 650, 000	Gull Harbour hatchery...	7, 650, 000	
Swan creek, Lake Manitoba.	253, 810, 000	Swan Creek hatchery...	169, 830, 000	
		Swan creek...	75, 820, 000	
		Marsh Point creek...	8, 160, 000	
Jackfish-Murray lakes, McIntosh creek, Sask.	67, 065, 000	Murray lake...	24, 055, 000	
Qu'Appelle river, Arnold's point and Sioux river, Sask.	11, 690, 000	Fort Qu'Appelle hatchery...	43, 010, 000	
Buffalo bay, Alta.	58, 125, 000	Fort Qu'Appelle hatchery...	11, 690, 000	
Four Mile creek, Pitt lake, B.C.	308, 000	Lesser Slave lake hatchery...	58, 125, 000	
Seven Mile creek, Pitt lake, B.C.	689, 000	Pitt lake hatchery...	308, 000	
Ten Mile creek, Pitt lake, B.C.	154, 000	Pitt lake hatchery...	689, 000	
Chas. Peter's creek, Pitt lake, B.C.	1, 665, 000	Pitt lake hatchery...	154, 000	
Mountain slough, Pitt lake, B.C.	2, 499, 000	Pitt lake hatchery...	1, 665, 000	
Harrison lake, B.C.	191, 000	Pitt lake hatchery...	2, 499, 000	
Sweltzer creek, Cultus lake, B.C.	11, 113, 285	Cultus lake hatchery...	191, 000	
Birkenhead river, Pemberton hatchery, B.C.	18, 000, 000	Smiths Falls hatchery...	4, 506, 160	
Adams river, Squilax Camp, Shuswap District, B.C.	505, 000	Smiths Falls hatchery...	6, 607, 125	
Crawford creek, Stuart lake, B.C.	(b) 41, 000	Pemberton hatchery...	18, 000, 000	
Rainbow lake, Stuart lake, B.C.	(b) 28, 000	Biological Board...	505, 000	
Genesi creek, Rivers inlet hatchery, B.C.	4, 494, 000	Stuart lake hatchery...	(b) 41, 000	
Quap creek, Rivers inlet hatchery, B.C.	15, 580, 000	Stuart lake hatchery...	(b) 28, 000	
Salmon creek, Lakelse lake hatchery, B.C.	126, 000	Rivers inlet hatchery...	4, 494, 000	
Scullabuchan creek, Lakelse lake, B.C.	3, 911, 000	Lakelse lake hatchery...	15, 580, 000	
Williams creek, Lakelse lake hatchery, B.C.	4, 146, 000	Lakelse lake hatchery...	126, 000	
Morrison creek, Babine lake hatchery, B.C.	7, 830, 000	Lakelse lake hatchery...	3, 911, 000	
Anderson lake, Vancouver island, B.C.	8, 505, 000	Lakelse lake hatchery...	4, 146, 000	
Kennedy lake, Vancouver island, B.C.	7, 492, 000	Babine lake hatchery...	4, 146, 000	
Spray lakes, near Banff, Alta.	505, 105	Kennedy lake hatchery...	7, 830, 000	
Cottonwood creek, Cowichan lake, B.C.	54, 000	Anderson lake hatchery...	7, 830, 000	
Nixon creek, Cowichan lake, B.C.	108, 500	Kennedy lake hatchery...	8, 505, 000	
Sutton creek, Cowichan lake, B.C.	38, 700	Spray lakes hatchery...	7, 492, 000	
Lardeau river, Trout lake, B.C.	1, 008, 000	Cowichan lake hatchery...	505, 105	
Fish lake, near Kamloops, B.C.	260, 000	Cowichan lake hatchery...	505, 105	
Paul creek, near Kamloops, B.C.	182, 000	Cowichan lake hatchery...	108, 500	
Pimantan creek, near Kamloops, B.C.	966, 000	Gerrard hatchery...	38, 700	
Hyas Long lake, near Kamloops, B.C.	87, 500	Fish lake, B.C.	1, 008, 000	
Penask creek, Nicola Valley, B.C.	1, 217, 000	Lloyd's creek hatchery...	130, 000	
Spahomin creek, Nicola Valley, B.C.	53, 000	Lloyd's creek hatchery...	130, 000	
Yarmouth hatchery ponds, Yarmouth county, N.S.	2, 050	Lloyd's creek hatchery...	182, 000	
St. John hatchery ponds, St. John, N.B.	251, 986	Lloyd's creek hatchery...	966, 000	
		Lloyd's creek hatchery...	87, 500	
		Lloyd's creek hatchery...	1, 217, 000	
		Lloyd's creek hatchery...	53, 000	
		Lloyd's creek hatchery...	2, 050	
		Lloyd's creek hatchery...	251, 986	

THE FOLLOWING TABLE SHOWS BY SPECIES THE LOCAL COLLECTIONS OF EGGS MADE DURING 1929, THE POINT WHERE SUCH EGGS WERE TAKEN AND HATCHERY IN WHICH THE EGGS WERE LAID DOWN, WITH NUMBERS LAID DOWN IN EACH CASE—*Continued*

Species	Collection Area	Number collected	Laid down in	Number laid down	Subtotals	Totals
Hybrid brown trout.....	Yarmouth hatchery ponds, Yarmouth county, N.S.	2,050	Yarmouth hatchery.....	2,050	2,050	
Loch Leven trout.....	St. John hatchery ponds, St. John, N.B.	44,581	St. John hatchery.....	44,581	44,581	46,631
	Yarmouth hatchery ponds, Yarmouth county, N.S.	1,105	Yarmouth hatchery.....	1,105	1,105	
Rainbow trout.....	St. John hatchery ponds, St. John, N.B.	46,592	St. John hatchery.....	46,592	46,592	47,697
	Pisquid lake, P.E.I.	49,445	St. John hatchery.....	49,445	49,445	
	Cameron lake, Waterton lakes, Alta.	26,535	Kelly's pond hatchery.....	26,535	26,535	
	Cottonwood lake, Nelson, B.C.	34,040	Waterton lakes hatchery.....	34,040	34,040	
Salmon trout.....	Six Mile lake, Nelson, B.C.	225,600	Nelson hatchery.....	225,600		
	Cold lake, N. E. of Edmonton, Alta.	269,200	Nelson hatchery.....	269,200	404,800	604,820
Kennerly's salmon.....	Banff hatchery ponds, Banff, Alberta.....	66,475	Nelson hatchery.....	66,475	66,475	
	Kokanee creek, Kootenay lake, B.C.	9,500	Cold lake, and Banff.....	9,500	9,500	75,975
Steelhead salmon.....	Sweltzer creek, Kootenay lake, B.C.	281,418	Banff hatchery.....	281,418		
	Sweltzer creek, Cultus lake, B.C.	216,030	Nelson hatchery.....	216,030	497,448	497,448
	Cowichan river, Vancouver island, B.C.	38,500	Cultus lake hatchery.....	38,500	38,500	
Chum salmon.....	Nutfall creek, Vancouver island, B.C.	129,700	Cowichan lake hatchery.....	129,700		
Coho salmon.....	Sweltzer creek, Cultus lake, B.C.	8,200	Cowichan lake hatchery.....	8,200	137,900	176,400
	Sweltzer creek, Cultus lake, B.C.	35,000	Cultus lake hatchery.....	35,000	35,000	35,000
	Cowichan river, Vancouver island, B.C.	246,000	Cultus lake hatchery.....	246,000	246,000	
Spring salmon.....	Cowichan river, Vancouver island, B.C.	912,200	Cowichan lake hatchery.....	912,200	912,200	1,158,200
		432,000	Cowichan lake hatchery.....	432,000	432,000	432,000
						*884,107,422

(a) Includes small collection taken in 1930.

(b) Landlocked sockeye salmon.

* This collection represents intake from spring and autumn spawners 1929. The fry and fingerlings resulting from the spring spawners were distributed 1929, but most of the eggs collected from the autumn spawners are still on hand and will not be distributed until spring of 1930.

The following summary gives, by species, the total receipt of eggs at all Federal hatcheries during the year ended December 31, 1929:—

Atlantic salmon.....	23,855,252
Landlocked salmon.....	84,000
Rainbow trout.....	604,820
Cutthroat trout.....	706,305
Steelhead salmon.....	176,400
Kamloops trout.....	3,773,500
Sockeye salmon.....	87,277,285
Spring salmon.....	432,000
Coho salmon.....	1,158,200
Chum salmon.....	35,000
Speckled trout.....	4,237,873
Whitefish.....	357,505,000
Salmon trout.....	75,975
Pickarel.....	398,340,000
Brown trout.....	254,036
Brown trout (hybrid).....	46,631
Loch Leven trout.....	47,697
Kennerly's salmon.....	497,448
	<hr/>
	884,107,422

The following purchases were also made:—

Brown trout eyed eggs from Cedar Island lodge, via Brule, Wisconsin, laid down as follows—		
Banff hatchery.....	210,830	
Fort Qu'Appelle hatchery.....	103,000	
	<hr/>	313,830
Cutthroat trout eyed eggs from S. S. Drew, Esq., Troy, Montana, laid down as follows—		
Waterton lakes hatchery.....	504,000	
Cutthroat trout eyed eggs from S. S. Drew, Esq., Butte, Montana, laid down as follows—		
Banff hatchery.....	1,088,000	
Cutthroat trout eyed eggs from S. S. Drew, Esq., Warm Springs, Montana, laid down as follows—		
Sumas river, B.C.....	25,000	
Kanakan creek, B.C.....	25,000	
Nicomekl river.....	434,245	
	<hr/>	2,076,245
Loch Leven trout eyed eggs from Cedar Island Lodge, via Bozeman, Montana, laid down at Banff hatchery.....	288,217	
	<hr/>	288,217
Rainbow trout eyed eggs from S. S. Drew, Troy, Montana and Gateway, Montana, laid down as follows—		
Banff hatchery.....	751,200	
Waterton Lakes hatchery.....	692,930	
	<hr/>	1,444,130
Speckled trout from American Fish Culture Co., Carolina, R.I., laid down as follows—		
Antigonish hatchery.....	991,400	
Bedford hatchery.....	1,052,175	
Middleton hatchery.....	1,143,544	
Yarmouth hatchery.....	1,090,000	
Florenceville hatchery.....	494,750	
Grand Falls hatchery.....	988,800	
St. John hatchery.....	46,680	
Kelly's pond hatchery.....	490,300	
	<hr/>	6,297,649
Speckled trout from Brook Trout Co., of Penn Forest, Mauch Chunk, Pa., laid down as follows—		
Antigonish hatchery.....	483,000	
Bedford hatchery.....	473,170	
Yarmouth hatchery.....	480,900	
Florenceville hatchery.....	475,020	
St. John hatchery.....	26,320	
	<hr/>	1,938,410
Speckled trout from Paradise Brook Trout Co., Cresco, Pa., laid down as follows—		
Antigonish hatchery.....	930,930	
Bedford hatchery.....	697,310	
Middleton hatchery.....	1,653,635	
Windsor hatchery.....	35,000	
Yarmouth hatchery.....	1,050,000	
Grand Falls hatchery.....	879,420	
Miramichi hatchery.....	100,395	
Restigouche hatchery.....	264,345	
St. John hatchery.....	38,480	
Kelly's Pond hatchery.....	550,260	
Jasper Park hatchery.....	251,664	
	<hr/>	6,451,439

18,809,920

Donation received—

Salmon trout eyed eggs from the Department of Game and Fisheries, Ontario, Port Arthur hatchery, laid down as follows—
 Fort Qu'Appelle hatchery.....
 Winnipegosis hatchery.....

98,600
 115,500
 214,100

Grand total of eggs received during calendar year 1929..... (a) 903,131,442

(a) This collection represents intake from spring and autumn spawners 1929. The fry and fingerlings resulting from the spring spawners were distributed in 1929, but most of the eggs obtained from the autumn spawners are still on hand and will not be distributed until spring of 1930.

The following exchanges were made in 1929:—

In exchange for Atlantic salmon—

Brown trout eyed eggs from the "Trout Brook Company, Hudson, Wisconsin." Laid down at Fort Qu'Appelle hatchery..... 31,000
 Cutthroat trout eyed eggs from "United States Bureau of Fisheries, Yellowstone Park, Wyoming." Laid down at Waterton Lakes Park hatchery 500,180
 Steelhead salmon eyed eggs from "Bureau of Fish Culture, California, U.S.A." Laid down at Cultus Lake hatchery..... 25,000

In exchange for Kamloops trout—

Cutthroat trout eyed eggs from the Cranbrook Trout Club hatchery. Laid down at Cowichan lake hatchery..... 25,000

STATEMENT OF EGGS AND FRY SUPPLIED TO OTHER THAN THE DOMINION GOVERNMENT HATCHERIES DURING 1929

Species	Number	Stage of development	Source	To
Atlantic salmon.	200	Eggs.....	Bedford hatchery.....	Biological Board, Professor Gowanloch (donated).
Atlantic salmon.	1,350	Eggs.....	Bedford hatchery.....	Biological Board, Dr. Leim (donated).
Atlantic salmon.	300	Fingerling	St. John hatchery.....	Biological Board, St. Andrews (donated).
Atlantic salmon.	28,000	Eggs.....	Miramichi hatchery.....	Bureau of Fish Culture, California, Port Seward hatchery, in exchange for Steelhead salmon eggs.
Atlantic salmon.	1,000,000	Eggs.....	Miramichi hatchery.....	United States Bureau of Fisheries, Craig Brook hatchery, East Orland, Maine, in exchange for Loch Leven trout eggs received at Banff and Fort Qu'Appelle hatcheries in December, 1928, and Cutthroat trout eggs received at Waterton Lakes hatchery in 1929.
Kamloops trout.	100,000	Eggs.....	Lloyds Creek hatchery.	Fisheries Experimental Station, Archi-Ken, Japan (Mr. T. Wake) (sold).
Kamloops trout.	20,000	Eggs.....	Lloyds Creek hatchery.	Ewings hatchery, B. C. (sold).
Kamloops trout.	30,000	Eggs.....	Lloyds Creek hatchery.	Sunnyside hatchery, B.C. (sold).
Kamloops trout.	25,000	Eggs.....	Penask Subhatchery....	Sunnyside hatchery, B.C. (sold).
Kamloops trout.	75,000	Eggs.....	Lloyds Creek hatchery.	Cranbrook Trout Club hatchery, B.C., in exchange for Cutthroat trout.
Kamloops trout.	50,000	Eggs.....	Nelson hatchery.....	Cranbrook Trout club hatchery, B.C., in exchange for Cutthroat trout.
Speckled trout..	230	Fry.....	Bedford hatchery.....	Biological Board, Professor Gowanloch (donated).
Sockeye salmon.	3,060	Eggs.....	Cultus Lake hatchery..	University of British Columbia, Mr. Pillsbury (donated).
Sockeye salmon.	525,000	Eggs.....	Cultus Lake hatchery..	Biological Board, Dr. Foerster (donated)

In the interest of economy and convenience in the distribution of fry the following transfers of eyed eggs were made in 1929:—

Species	From	To	Number
Atlantic salmon.....	(a) Bedford hatchery.....	Antigonish hatchery.....	500,000
	(a) Margaree hatchery.....	Lindloff hatchery.....	300,000
	(a) Middleton hatchery.....	Windsor hatchery.....	4,000
	(a) Florenceville hatchery.....	Miramichi hatchery.....	500,000
	(a) Florenceville hatchery.....	Yarmouth hatchery.....	250,000
	(a) Grand Falls hatchery.....	Tobique hatchery.....	500,000
	(a) Grand Falls hatchery.....	Yarmouth hatchery.....	500,000
	(a) Restigouche hatchery.....	Nipisiquit hatchery.....	401,192
	(a) St. John hatchery.....	Yarmouth hatchery.....	500,000
	(a) Kelly's Pond hatchery.....	Antigonish hatchery.....	250,000
	(a) Middleton hatchery.....	Windsor hatchery.....	6,700
Speckled trout.....	(a) St. John hatchery.....	Antigonish hatchery.....	10,000
	(a) St. John hatchery.....	Yarmouth hatchery.....	10,000
	(a) Nelson hatchery.....	Summerland hatchery.....	107,500
Whitefish.....	(a) Fort Qu'Appelle hatchery.....	Summerland hatchery.....	5,000,000
Pickarel.....	(b) Fort Qu'Appelle hatchery.....	Banff hatchery.....	1,360,000
Rainbow trout.....	(b) St. John hatchery.....	Kelly's Pond hatchery.....	18,792
	(c) Banff hatchery.....	Jasper Park hatchery.....	50,000
	(b) Cold Lake camp.....	Banff hatchery.....	44,540
Salmon trout.....	(b) Gerrard hatchery.....	Nelson hatchery.....	500,000
Kamloops trout.....	(b) Lloyds creek hatchery.....	Lakelse lake hatchery.....	125,000
	(b) Lloyds creek hatchery.....	Nelson hatchery.....	75,000
	(b) Lloyds creek hatchery.....	Pemberton hatchery.....	30,000
	(b) Penask lake.....	Cowichan Lake hatchery.....	2,000
	(b) Penask lake.....	Pemberton hatchery.....	25,000
	(b) Penask lake.....	Summerland hatchery.....	464,855
	(a) Cultus Lake hatchery.....	Harrison Lake hatchery.....	7,602,400
Sockeye salmon.....	(a) Cultus Lake hatchery.....	Pemberton hatchery.....	1,001,000
Steelhead salmon.....	(b) Cowichan Lake hatchery.....	Cultus Lake hatchery.....	25,000

(a) 1928 fall collection.

(b) 1929 collection.

(c) These were purchased from S. S. Drew, Troy, Montana, and laid down at Banff hatchery May, 1929, then shipped on to Jasper Park hatchery.

The following marking of salmon was done in 1929:—

—	Species	Number marked	Date of marking	Nature of mark	Object—To throw some light on
River Philip, N.S.....	Atlantic salmon, stripped....	247	Nov. 1, 6, 9, 11, 12, 16 and 19...	Silver tag attached to dorsal fin.	The direction (easterly or westerly) that these fish take when they go to sea and the direction (easterly or westerly) from which they come when they return to this river.
Allen's lake, N.S.....	" "	21	Oct. 18, 21, 22, 25, 27, Nov. 5, Dec. 13.	"	The movement of the salmon that resort to this river to spawn.
Tabusintac river, N.B.....	" unstripped..	2	May 26, 1929.....	"	"
Kelly's Pond hatchery— Morell river	" stripped.....	137	Nov. 26, 27, 28.....	"	"
Babine lake hatchery— Morrison creek.....	Sockeye salmon fingerlings..	1,045	Aug. 16, 18.....	Removal of adipose fin.....	The frequency of spawning and extent to which late fish of any season return as late fish.
Stuart lake hatchery— Alexander lake.....	Sockeye salmon yearlings....	3,100	May 14, 15.....	Clipping the adipose fin and the posterior half of the dorsal fin.	The percentage of artificially fed fry that return as adult salmon.
Rainbow lake.....	" "	1,000	May 6, 8.....	"	"

ANTIGONISH HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Calder's lake (Pictou Co.).....			7,000	
Cole Harbour (Guys Co.)—				
Chain of lakes.....			70,000	
Cole Harbour lake.....			40,000	
Country Harbour (Guys Co.)—				
Country Harbour river.....		80,000		
Goshen lake.....			30,000	
Cudahys lake (Guys Co.).....			40,000	
Gairloch lake (Pictou Co.).....			7,000	
George Bay—				
Afton river.....	70,000			
North lake.....			48,000	
South lake.....			47,000	
Gordon's lake (Pictou Co.).....			7,000	
Lochaber lake (Antig. Co.)—				
Cummings lake.....			39,492	
McLeans lake (Pictou Co.).....			13,000	
Merrigomish Harbour (Pictou Co.)—				
Barney's river.....	70,000			
Forbes lake.....			14,000	
Brown lake.....			12,000	
French river.....		70,000		
Branch.....			30,000	
Northumberland Strait (Pictou Co.)—				
River John.....			70,000	
Gammon brook.....			10,000	
Pictou Harbour (Pictou Co.)—				
East river.....		70,000	12,000	
Big brook.....			15,000	
McClellan's brook.....			30,000	
West branch lake.....			6,500	
Middle river.....		70,000		
Sutherlands river.....		70,000		
Pomquet river (Antig. Co.)—				
Glenroy river.....			18,000	
Hetherington river.....			50,000	
Meadow Green river.....			40,000	
Salmon river (Guys Co.).....	50,000	30,000		
St. Marys Bay (Guys Co.)—				
East St. Marys river.....	180,000			
West St. Marys river.....	90,000	90,000		
South River (Antig. Co.).....		5,780	99,370	
Copper lake.....			30,000	
Loch Katrina.....			50,000	
Pinevale Brook.....			41,500	
Polsons brook.....			20,000	
Taylors lake (Pictou Co.).....			6,500	
Tracadie Harbour (Antig. Co.)—				
Tracadie river.....	60,000			
Mattie river.....	30,000			
West river (Antig. Co.).....			60,000	
Gaspereau lake.....			60,000	
Beaver Meadow river.....				693
West river (Pictou Co.).....			30,000	
	550,000	485,780	1,053,362	693

Total distribution..... 2,089,835

BEDFORD HATCHERY

	Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speckled trout fry	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings
Anderson lake (Halifax Co.)—							
Wrights brook.....						30,000	
Bedford basin (Halifax Co.)—							
Anderson lake.....						10,000	
Sackville river.....				450			
Middle Sackville river.....			15,000				
Upper Sackville river.....			20,000				
Belmont river (Col. Co.)—							
Belmont brook.....							
Big Cranberry lake (Halifax Co.)—						30,000	
Cranberry lake.....							
Biological Board—						30,000	
Dalhousie University, Prof. Gowanloch.....		200			230		
Dalhousie University—Dr. Leim.....	1,350						
Chester basin (Lun. Co.)—							
Middle river.....			40,000				
Chezzetcook Harbour—							
Chezzetcook bay.....			50,000				
Cobequid Bay—							
Beaver brook.....						30,000	
Folley lake.....						30,000	
North river (forks).....						60,000	
Pleasant Valley brook.....						30,000	
Cole Harbour (Halifax Co.)—							
Little Salmon river.....			50,000				
Debert river (Col. Co.)—							
Blackies lake brook.....							20,000
Echo lake (Halifax Co.)—							
Big Salmon river.....			70,000				
Economy river (Col. Co.)—							
Economy lake.....						40,000	
Guysborough Harbour—							
Cross lake.....						12,000	
McPherson lake.....						30,000	
Round lake.....						8,000	
Hubbards river (Lun. Co.)—							
Mill lake.....						45,000	
Sawlors lake.....			50,000				
Tip Hill lake.....						45,000	
Vinegar lake.....							12,000
Larrys lake (Guys. Co.)—							
Donohue lake.....						35,000	
Maccan river (Cum. Co.).....							
Harrison lake.....			40,000				
Mahone Bay (Lun. Co.)—							40,000
East river.....			110,000				
Gold river.....			70,000				
Martin river—							
Spondo.....			50,000				
Musquodoboit river (Halifax Co.)—							
Dollar lake brook.....			50,000				
Gleasons lake.....						30,000	
Lays lake.....						45,000	
Upper Musquodoboit river.....			45,000				
Nine Mile lake (Hants Co.)—							
Robinson brook.....						45,000	
Northumberland Strait—							
Philip river.....			230,000				
Black lake.....						40,000	
Portaupique river (Cumb. Co.)—							
Sutherland lake.....						30,000	
Salmon river (Col. Co.)—							
Christie brook.....						30,000	
Kempton brook.....						30,000	
Second lake (Halifax Co.)—							
Lake Charles.....						30,000	
Shag Bay (Halifax Co.)—							
Nine Mile river.....			60,000				
Ship Harbour river (Halifax Co.)—							
Ship Harbour lake.....			30,000				
Shubenacadie river (Halifax Co.)—							
Rasleys run.....			40,000				
Rawdon river.....			30,000				
Rocky brook.....			20,000				
Springfield lake.....						30,000	35,000
Waverly lake.....			29,500				
Williams lake.....						30,000	10,000
South River (Guys. Co.)—							
Grants lake.....						15,000	

BEDFORD HATCHERY—*Concluded*

	Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speckled trout fry	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings
Stewiacke river (Col. Co.)—							
Creamery brook.....						30,000	
McCallums brook.....						30,000	
Otter brook.....						45,000	
South branch river.....						30,000	
St. Andrews river.....						30,000	
Youngs brook.....						30,000	
St. Margarets Bay—							
Oisier river (Halifax Co.).....			60,000				
Black Point lake.....						35,000	
Half Mile lake.....						45,000	
Sheldrake lake.....						45,000	
Terence Bay—							
McGrath lake (Halifax Co.).....						55,000	10,000
Hatchet lake.....						55,000	
	(a) 1,350	200	1,159,500	450	230	1,250,000	127,000
Total distribution.....						2,538,730	

LINDLOFF HATCHERY

(Subsidiary to Margaree Hatchery)

Atlantic
salmon fry

Dennys river—	
Big brook.....	20,000
Tom's brook.....	11,600
Grand river—	
McKay brook.....	40,000
Grand lake.....	
Kytes brook.....	25,000
Framboise river—	
Three rivers.....	35,000
Inhabitants river—	
McDonald's brook.....	35,000
Salmon river.....	50,000
Tillard river—	
Black river.....	17,000
Maddans river.....	17,000
Scotts river.....	17,000
West Tillard.....	30,000

Total distribution..... 297,600

297,600

MARGAREE HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Baddeck river—				
Crowdis brook.....	25,000			
Forks bridge.....	50,000			
Harris brook.....	50,000		10,000	
Red bridge.....	50,000			
West branch.....	50,000			
George Bay—				
Graham's brook (Inverness Co.).....			5,000	
Gulf of St. Lawrence—				
Grand Anse river.....			10,000	
Little River Cheticamp.....	75,000			
Red river.....			10,000	
Inhabitants river—				
McColls brook (Inverness Co.).....			5,000	
Margaree river—				
Big brook.....	60,000			
Big Intervale bridge.....		50,000		
Black Rock pool.....	50,000			
Cranton bridge.....	50,000			
Crowdis bridge.....	50,000			
Crowdis pool.....		80,000		
Dunns brook.....	30,000			
Egypt brook.....			10,000	

MARGAREE HATCHERY—*Concluded*

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Margaree river— <i>Concluded</i>				
Gallants brook.....	25,000			
Greigs crossing.....		20,000		
Hatchery brook.....			40,000	
Harts pool.....	50,000			
Ingraham pool.....		55,000		
Lake Olaw.....	30,000			
Levis brook.....	15,000			
McDermids crossing.....		100,000		
McDougall's brook.....	10,000			
Nelsons pool.....		100,000		
Rock pool.....		25,000		
Ross bridge.....		100,000		
Ross pool.....		100,000		
Tingley's crossing.....		95,000		
Ward's pool.....		100,000		
Watson's brook.....	10,000			
Whitley's pool.....	50,000			
Middle river.....		90,000		
Beaver brook.....	40,000			
Foot bridge.....	40,000			
Indian brook.....	50,000			
McLennan's bridge.....	50,000			
Mira Bay—				
Black brook.....				10,000
Ocean—				
Clyburn brook (Victoria Co.).....			5,000	
Warren's brook (Victoria Co.).....			5,000	
St. Ann's Bay—				
Barasois river.....		55,000		
Goose Cove brook.....			10,000	
Indian brook.....		25,000		
South Gut.....			10,000	
St. Ann's river.....		25,000		
Church brook.....			10,000	
Smith pool.....		25,000		
Sydney Harbour—				
Foresters lake.....				10,000
Gillis lake.....			4,822	
Grand lake.....			360	4,640
Kilkenny lake.....				5,000
Meadow brook.....			5,000	
Trout brook.....				10,000
Whycocomagh bay—				
Indian brook.....			10,000	
	910,000	1,045,000	150,182	39,640

Total distribution.....2,144,822

MIDDLETON HATCHERY

	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 3 finger- lings	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings	Speckled trout No. 3 finger- lings
Annapolis river.....		30,000	42,000			
Brooks.....				20,000		
Hatchery pond.....					2,000	
Nictaux river.....			80,000	25,000		
Crisp brook.....				5,000		
Oakes brook.....				20,000		
Shannon river.....				25,000		7,000
Megill lake.....				25,000		
Trout lake.....				25,000		
Makeown lake.....				10,000		
Scrugg lake.....				30,000		
Wamboldts lake.....						6,000
Waterloo lake.....				25,000		5,930
Round Hill river.....		45,000				

MIDDLETON HATCHERY—*Concluded*

	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 3 finger- lings	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings	Speckled trout No. 3 finger- lings
Atlantic Ocean—						
Gold river.....	50,000	40,000				
Medway river.....		170,000				
Ankle Jack lake, near Lapland (Lunenburg Co.).....					25,000	
Mersey river.....		35,000	40,000			
Kedgemakoodge lake.....				40,000		
LaHave river.....	50,000	85,000		50,000		
Nine Mile lake.....				40,000		
Ninevah lake.....				25,000		
Whetstone lake.....				25,000		
Petite riviere.....		35,000				
Bay of Fundy—						
Bear river—						
East, West branch.....				35,000		
Sand lake (Annapolis Co.).....					10,000	
Cornwallis river (Kings Co.)—						
Aylsford lake—						
Lake George.....				25,000		
Loon lake.....					25,000	
Habitant river.....					25,000	
Tupper brook.....				15,000		
Streams near Somerset Creek.....				10,000		
Welsford brook.....				15,000		
Dominion Atlantic Railway—						
Grand Pre—						
Ponds Memorial Park (Horton Township).....					600	
Elliotts lake (Annapolis Co.).....				25,000		
Joe Simon lake (Annapolis Co.)—						
Birch Bark lake.....				10,000	15,000	
Joggins river—						
Sydas lake (Digby Co.).....					25,000	
Liverpool river—						
Munroe lake.....				40,000		
Minas Basin—						
Avon river—						
Aylward Pond.....						500
Cards lake.....				50,000		
Gaspereau river.....	50,000	40,000				
Bear brook.....				30,000		
Trout brook.....				30,000		
Halfway river.....				25,000		
Davison lake.....						7,500
Hebert river.....		40,000				
Kennetcook river.....			45,000			
Pleasant Valley lake.....					25,000	
Meander river.....		40,000				
Coxcombe lake.....					30,000	
Mockingigh.....				35,000		
Murphy lake.....				50,000		
Zwicker lake.....						10,000
Shay lake.....				15,000		
South branch.....		45,000				
West branch.....		45,000		40,000		
Ohio river (Hants Co.)—						
Lake Pleasant.....				25,000		
Smith lake.....				25,000		
Rawdon river—						
Nixes lake.....				25,000		
Pentz lake.....				25,000		
Sissiboo river (Digby Co.)—						
Andrews lake.....				25,000		
Haines lake.....				25,000		
Porters lake.....				25,000		
Tom Wallace lake.....					25,000	
St. Croix river—						
Cameron lake.....				25,000		7,000
Panuke lake.....				50,000		
Piggott lake.....				15,000	5,000	6,000
	150,000	650,000	207,000	1,105,000	212,600	49,930

Total distribution.....2,374,530

MARINE AND FISHERIES

FLORENCEVILLE HATCHERY

	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speck- led trout ad- vanced fry	Speck- led trout No. 1 finger- lings	Speck- led trout No. 4 finger- lings	Speck- led trout No. 5 finger- lings	Speckled trout		
							1 yr. olds	2 yr. olds	6 yr. olds
Maudslay lake (Charlotte Co.)—									
Little McAdams brook.....				35,000					
Little Duck lake.....				10,000					
Miramichi river—									
Bogan brook.....	15,000								
Clearwater brook.....	15,000								
Elliotts brook.....	30,000								
North branch.....		67,000							
Simpson brook.....	10,000								
South branch.....	115,000	5,000							
South West Miramichi—									
North branch.....	45,000	20,000							
South branch.....	10,000								
Teague brook.....		10,624							
Ottawa.....						1	1	1	1
Passamaquoddy Bay—									
Digdeguash river.....				100,000					
St. Croix river—									
Palfrey brook.....				20,000					
Skiff lake.....	75,000								
First Eel lake.....				20,000					
Second Eel lake.....			15,000						
St. John river—									
Becaguinee river.....	150,000	15,000							
Indian brook.....				40,000					
Bennett lake.....				20,000					
Bubby brook.....				10,000					
Bulls creek.....				60,000					
Buttermilk creek.....				1,000	185				
Eel river.....	50,000								
Bull creek.....	40,000								
Gesquit river.....				35,000					
Gibson Mill brook.....	30,000								
Hardwood creek.....				15,000					
Hathaway brook.....				15,000					
Keswick river.....	75,000								
Lanes brook.....				10,000					
Mactaquack river.....	40,000								
Meduxnekeag river.....	112,500	12,000							
Hagerman brook.....				25,000					
Marven brook.....	12,500								
Monquart river.....	50,000	42,000							
Nackawic river.....	50,000								
Taffa lake.....				5,000					
Nashwaak river.....		135,000							
Nashwaaksis river.....				60,000					
Pokiok river.....				50,000					
Presquille river.....	100,000	10,000							
Centreville Pond.....								200	
Dingee brook.....				2,500					
Mile brook.....				3,000					
Little Presquille river.....	25,000								
Lakeville lake.....							613		
Risteen lake.....				30,000					
River de Chute.....				35,000					
Shiktohawk river.....	135,000	15,000							
Glassville Pond.....				15,000					
Priests brook.....				20,000					
Priests Pond.....									
Shogomoc river.....							500		
Stickney brook.....				60,000					
Tweedie brook.....				6,000					
White Marsh brook.....				1,000					
				20,000					
	1,185,000	331,624	15,000	723,500	185	1	1,114	201	1

Total distribution.....2,256,626

GRAND FALLS HATCHERY

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Salmon River.....	75,000	25,000			
Aubin crossing.....	85,000				
Big Bogan.....	50,000	25,000			
Boat landing.....	100,000				
Covered bridge.....	65,000				
Davis mill.....	60,000				
Foley brook.....	110,000				
Little Salmon river.....	100,000				
Mac Cyr Flats.....	35,000	50,000			
Mooney brook.....	40,000	25,000			
Sutherland brook.....					50,000
Tom Cote Mill.....	70,000				
St. John River.....		12,500			
Andover bar.....	100,000				
Argossey.....	100,000				
Arrostock bar.....	150,000	50,000			
Baker lake.....				50,000	
Beaver brook.....			40,000		
Glazier lake.....					40,000
Grand river.....			60,000		
Green river.....				50,000	
Hatchery brook.....				20,000	
Indian Ferry.....	100,000				
Inman siding.....	85,000				
Iroquois river.....				50,000	
Kilburn Ferry.....	75,000				
Ledges Pond.....				25,000	
Limestone siding.....	50,000	50,000			
Little River (Grand Falls).....				75,000	
Little river (St. John river).....				50,000	
Little river of Tilly.....					10,000
Coombie brook.....					10,000
Dead brook.....					10,000
Ryan brook.....					10,000
Little River of St. Francis (Mada- waska Co.).....					30,000
Lower Perth.....	25,000	50,000			
Madawaska river (Madawaska Co.).....					20,000
Trout stream.....					20,000
Morell siding.....	50,000	50,000			
Muniac brook.....	60,000	40,000			
Upper Muniac.....	25,000				
Lower Muniac.....	25,000				
Nine Mile brook.....				7,500	
Ortonville siding.....		13,787			
Poitras brook.....			7,500		
Price brook.....					7,574
Quisibis river.....				40,000	
Sigis river.....				40,000	
Thompson lake.....				40,000	
Unique lake.....					35,000
	1,635,000	391,287	107,500	447,500	242,574

Total distribution..... 2,823,861

MIRAMICHI HATCHERY

	Atlantic salmon No. 1 fingerlings	Speckled trout No. 1 fingerlings
Memramcook river (Westmoreland Co.) at Calhoun.....		15,000
Miramichi river—		
Barnaby river.....	200,000	
Bartibogue river.....	150,000	
Little Bartibogue.....		10,000
Bay du Vin.....	75,000	
Black river.....	150,000	
Burnt Church.....	75,000	
Nappan river.....	75,000	
Tabusintac river.....	75,000	
Eskedelloe.....		20,000
North West Miramichi river.....	1,200,000	
Millstream.....	150,000	
Sevogle river.....	96,000	
Parks brook.....		2,874
Stewart brook.....	40,000	
Trout brook.....	40,000	
Wild Cat brook.....	50,000	
South West Miramichi river—		
Bartholomew river.....	64,000	
Cains river.....	205,089	
Ferguson brook.....		6,000
McCanns brook.....		2,600
Renous river.....	192,000	
Dungarvon.....	128,000	
Taxis.....	128,000	
Little South West Miramichi.....	990,000	
Northumberland Strait—		
Cocagne river.....	60,000	
Kouchibouguacis.....		30,000
Richibucto river.....	32,000	
Molus river.....		10,000
	4,175,089	96,474

Total distribution..... 4,271,563

NIPISQUIT HATCHERY

(Subsidiary to Restigouche hatchery)

	Atlantic Salmon fry
Nipisquit river—	
Bear island.....	50,000
Church point.....	50,000
Club House pool.....	50,000
Comeau landing.....	40,284
Knight brook.....	60,000
Marchall Boudreau beach.....	40,000
Middle landing.....	30,000
Panineau river.....	60,000

Total distribution..... 380,284

380,284

RESTIGOUCHE HATCHERY

	Atlantic salmon fry	Atlantic salmon No. 1 fingerlings	Speckled trout fry
Chaleur Bay—			
Jacquet river.....	60,000		
Charlo river—			
Juniper lake.....			10,000
Matapedia river—	12,650	30,696	
Causapsal.....	59,000		
Chamberlain lake.....			10,000
Glen Emma.....	50,000		
Millstream Falls.....	50,000		
Milnikek.....	50,000		
Pitt siding.....	60,000		
St. Alexis.....	50,000		
St. Florence.....	59,000		
Routhierville.....	60,000		
Restigouche river—			
Christopher brook.....			45,000
Loch Lomond lake.....			4,000
Dawsonville.....	100,000		
Little river.....			55,000
Moores Settlement.....		33,000	
Red Bank.....	240,000		
Runnymede.....	49,658		
Tom brook.....	240,000	850	
Upsalquitch river—	240,000	33,000	
Grog brook.....			32,725
	1,380,308	97,546	156,725

Total distribution..... 1,634,579

[illegible]

TOBIQUE HATCHERY

(Subsidiary to Grand Falls hatchery)

	Atlantic salmon fry
Tobique river—	
Tobique forks	75,000
Gaunces bogam	11,000
Gear flats	20,000
Haley brook	25,000
Hatchery brook	2,000
Millers Main river	75,000
Right Hand branch	40,000
Riley brook	50,000
Tobique above Riley's brook	25,000
Sission branch	40,000
Two brooks	75,000
Waters bogam	50,000
Total distribution	488,000

KELLY'S POND HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Afton lake, Queens Co.....				10,372			
Albion Bay (Kings Co.)—							
Brudnell river						10,000	
Montague pond						20,000	
McRae's pond						10,000	
Bedeque Bay—							
Dunk river (Prince Co.)			60,000				
Electric light pond						20,000	
Wilmot river—							
Clark's pond						5,000	
Wright Mill						10,000	
Cardigan Bay—							
Cardigan river	18,000					10,000	
Cascumpeque Bay—							
Huntley river—							
Leards pond						10,000	
Mill river						10,000	
Trout river						10,000	
Colville Bay—							
Mallard's pond						8,000	
McInnis pond						8,000	
Cove Head Bay (Queens Co.)—							
Essory's brook							2,000
Winter river	35,520						
Gulf of St. Lawrence—							
Adams pond						8,000	
Big pond						8,000	
Blooming Point pond—							
McCormick's brook					20,000	5,000	
O'Hara's brook					20,000	5,000	
Brander's pond						8,000	
Campbell's pond						8,000	
Cousins' pond						8,000	
Cow river						10,000	
East lake						27,000	
Hay river						10,000	
Naufrage pond						10,000	
Naufrage river			18,000				
North lake						27,000	
Priest's pond						8,000	
Schooner pond		15,000					
Tracadie lake						12,000	
Hillsboro Bay—							
Cole's stream—							
North river					11,200		
Cole's pond						5,000	
Clyde river						10,000	
Dunstaffnage brook						5,000	
Fanning brook						3,000	
Hatchery pond							976
Hillsboro river		18,000					
Ing's pond							2,000
Johnston river—							
Currie's brook						3,000	
North river		10,000	15,000				
Sherry's brook						5,000	
Jimmy Jim's lake (Queens Co.)				10,000			
Lake Verde (Queens Co.)						11,778	

KELLY'S POND HATCHERY—*Concluded*

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Murray Harbour—							
Greek river.....						8,000	
Murray river—							
McClure's pond.....						20,000	
New London Bay—							
Orwell Bay—							
Found's mill.....						10,000	
Hope river.....						10,000	
Mill Vale.....						10,000	
Newton river.....						10,000	
Vernon river—							
McMillan's pond.....						10,000	
Northumberland strait—							
Belle river.....						10,000	
Green stream (Prince Co.).....						10,000	
Little Pierre Jacques.....						10,000	
Pierre Jacques.....						10,000	
Miminegash pond—							
Cain's stream.....						10,000	
Sable river.....						10,000	
Pisquid Lake (Queens Co.).....				5,000			
Rollo Bay—							
Fortune river—							
North branch.....						15,000	
West branch.....						15,000	
Rustico Bay—							
Hunter river—							
Hazel Grove stream (Prince Co.).....						15,000	
Rackham's pond.....						14,000	
Rustico Harbour—							
Campbell's pond.....						10,000	
Wheatley river—							
Crooked creek.....						10,000	
St. Peter's Bay—							
Balderson's Mills (head of St. Peters bay)		15,000					
Leard's pond.....						5,000	
Morell river.....		30,000	2,567				
Crane's pond.....						10,000	
Fisheries Brook.....						6,000	
Gillan's stream.....	35,520						
McKinnon's stream.....	35,520						
South branch.....					11,200		
Tignish river—							
Haywood pond.....						10,000	
Round pond.....						10,000	
Tracadie bay—							
Black river.....						10,000	
Winter river—							
Watts stream.....					11,200	5,000	
Westmoreland Harbour—							
Craupaud river (Prince and Queens Co.)..						3,000	
	124,560	88,000	95,567	25,372	73,600	603,778	4,976

Total distribution..... 1,015,853

GULL HARBOUR HATCHERY

	Pickerel eyed eggs	Pickerel fry	Whitefish green eggs	Whitefish fry
Lake Winnipeg—				
Big island, east.....				4,175,000
Big island, north.....		1,500,000		14,000,000
Big island, west.....				2,500,000
Black island, west.....		135,000		12,000,000
Deer island, east.....				3,000,000
Little Bull Head bay.....				1,000,000
Matheson island.....				2,880,000
Narrows—bay south of narrows.....				1,440,000
Pigeon bay.....			1,800,000	
Punk island, north.....				6,000,000
Punk island, south.....		800,000		6,500,000
Berens river and vicinity, via C.G.S. <i>Bradbury</i> —				
Beacon island.....				1,440,000
Disboros bay.....				1,440,000
Flathead vicinity.....				1,440,000
Hatchery bay.....				1,440,000
Helgi's island.....				1,440,000
Hudson's Bay Company's bay.....				1,440,000
Lobstick island, vicinity.....				1,440,000
McDonald's bay.....				962,500
McKay island, vicinity.....				1,440,000
Methodist Mission, vicinity.....				1,440,000
Roman Catholic Mission bay.....				1,440,000
Sheep island.....				962,500
Taper's island.....				1,440,000
Whiteway's island.....				1,440,000
Assiniboine river, near City Park.....		100,000		
Bittern lake, near Roblin.....		75,000		
Burns lake, near Roblin.....		125,000		
Clear lake, in Riding mountains.....		125,000		
Cow Moose lake, east of Whitemouth.....		25,000		
Goose lake, near Roblin.....		100,000		
Happy lake, in Duck mountains.....		125,000		
Jackfish lake, near Roblin.....		150,000		
Killarney lake, near Killarney.....		125,000		
Little Saskatchewan river, near Brandon.....		125,000		
Madge lake, in Porcupine mountains.....		125,000		
Max lake, in Turtle mountains.....		75,000		
Megantic lake, Quebec.....		15,000		
Metigosche lake, Turtle mountains.....		125,000		
Minnedosa lake, near Minnedosa.....		125,000		
Oddfellow's lake, near Roblin.....		100,000		
Pelican lake, at Ninette.....		125,000		
Perch lake, near Inglis.....		125,000		
Red river, above and below Winnipeg.....		250,000		
Rideau river—				
Joek river (Manitock, Ontario).....	170,000			
Rock lake, near Glenora.....		125,000		
Round lake, near Inglis.....		125,000		
Sorbo lake, near Roblin.....		50,000		
Souris lake, near Melita.....		125,000		
Twin lake, in Duck mountains.....		125,000		
Williams lake, Turtle mountains.....		100,000		
	170,000	5,225,000	1,800,000	72,700,000
Total distribution.....			79,895,000	

SWAN CREEK HATCHERY

	Pickereel green eggs	Pickereel fry
Lake Manitoba—		
Marsh Point creeks.....	8,160,000	
Swan creek.....	75,820,000	56,000,000
	83,980,000	56,000,000
Total distribution.....	139,980,000	

WINNIPEGOSIS HATCHERY

	Salmon trout No. 1 fingerlings	Whitefish fry
Lake Winnipegosis—		
At hatchery.....		900,000
Bay south of hatchery.....		8,000,000
Fisheries.....		3,500,000
Horse Bluff to Long Island.....		2,000,000
Island lake—reefs, southeast end.....		3,500,000
Island lake—reefs northwest end.....		6,500,000
Island lake—north shore.....		1,000,000
Island lake—south shore.....		4,000,000
Island lake—west shore.....		2,000,000
Island—two miles from hatchery.....		7,600,000
Kettle bay.....		1,500,000
McKenzie point.....		4,500,000
Peonan point.....		1,000,000
Pine island to Shorty point.....		2,000,000
Pine island.....		5,500,000
Salt point, north.....		1,000,000
Salt point, south.....		2,000,000
Snake island, north.....		1,500,000
South of hatchery.....		2,000,000
Southeast of hatchery.....		2,500,000
Southwest of hatchery.....		2,000,000
Weasel island to Salt point.....		2,000,000
Little Saskatchewan river—		
Clear lake (Riding mountain).....	109,500	
	109,500	66,500,000
Total distribution.....	66,609,500	

COCHIN FISHING STATION

	Pickereel green eggs	Whitefish green eggs
North Saskatchewan river—		
Jackfish lake.....		24,275,000
Cochin creek.....		13,300,000
Murray lake.....	24,055,000	4,750,000
	24,055,000	42,325,000
Total distribution.....	66,380,000	

FORT QU'APPELLE HATCHERY

	Loch Leven trout No. 1 fingerlings	Pickereel fry	Salmon trout No. 1 fingerlings	Whitefish fry
Anderson lake, T. 41, R. 18 W. 2.....		400,000		
Antelope lake—				
Hart pond, S. 21, T. 15, R. 18, W. 3.....	500			
Beaver river—				
Makwa lake.....				1,000,000
Carrot river—				
Lake Lenore, T. 40-42, R. 21, W. 2.....		600,000		
Stony lake, T. 36, 37, R. 22, W. 2.....		600,000		
Cowan river—				
Okemasis lake.....				2,000,000
Crystal lake, T. 33, R. 3-4, W. 2.....		600,000		
Edwards lake, T. 39, R. 17, W. 2.....		400,000		
Little Frenchman creek—				
Calf creek.....	34,150			
Doyle creek.....	14,490			
Head of Little Frenchman creek.....	41,934			
Petrified creek.....	14,490			
Pierce creek.....	13,660			
Rose creek.....	14,490			
Manitou lake.....				200,000
Nelson lake, 3½ miles from Ketchen.....		450,000		
North Saskatchewan river—				
Birch lake.....				1,000,000
Brightsand lake.....			91,228	
Jackfish lake.....				2,000,000
Red Deer river—				
Emma lake—				
Christopher lake.....		750,000		
Turtle lake.....				2,000,000
Qu'Appelle river—				
Echo lake.....		18,602,500		3,500,000
Mission lake.....				1,000,000
Katepwa lake.....		2,000,000		1,000,000
Labret lake.....		2,000,000		
Long lake.....				2,000,000
Sioux lake.....		2,000,000		2,695,000
South Saskatchewan river—				
Elkwater lake (Alberta).....		1,000,000		
Whitesand river—				
York lake.....		600,000		
	133,714	30,002,500	91,228	18,395,000

Total distribution..... 48,622,442

BANFF HATCHERY

	Brown trout No. 1 fingerlings	Cut-throat trout Eyed eggs	Cut-throat trout Fry	Cut-throat trout Advanced fry	Cut-throat trout No. 1 fingerlings	Loch Leven trout Advanced fry	Loch Leven trout No. 1 fingerlings	Pickrel Fry	Rainbow trout Fry	Rainbow trout Advanced fry	Rainbow trout No. 1 fingerlings	Salmon trout Advanced fry
Athabaska river—												
Bow river—												
Beaver creek.....												
Big Hill creek.....												
Big lake.....												
Burn lake.....												
Cascade river.....				25,000	17,000					30,000		
Anthracite creek.....												
Four Mile creek.....			10,000									
Lake Minnewanka.....			15,000									
Pederson creek.....			10,000									
Castle river.....												
Cold creek.....				5,000								
Consolation lake.....				20,000								
Exshaw creek.....				20,000								
Forty Mile creek.....				30,000								
Whiskey creek.....			20,000									49,000
Gap creek.....												
Ghost river—				15,000								
Hay Meadow creek.....												
Healey creek.....				25,000								
Highwood river—				15,000								
Cataract creek.....												
Flat creek.....												
Pekisko creek.....												
Sullivan creek.....												
Jumping Pound creek.....												
Backwater creek.....				15,000								
Muskeg creek.....				5,000								
Ridgeway creek.....				10,000								
Spring creek.....				5,000								
Lake Louise.....				35,000								
Lizard lake.....			10,000									
Massive creek.....			25,000									
Moraine lake.....												
North Fish creek.....				20,000								
North Sheep creek.....									21,000			
Fisher creek.....				10,000								
Rip Rap creek.....				5,000								
Ware creek.....				5,000								
Pipstone creek.....				20,000								
Mud creek.....												
Pollack creek.....			35,000									
Redearth creek.....												
South Fish creek.....					15,000				10,000			

MARINE AND FISHERIES

JASPER PARK HATCHERY

	Rainbow trout fry	Speckled trout fry
Athabasca river—		
Maligne lake.....		198,786
Medicine creek, at Beaver dam.....		10,000
Miette river—		
Cabin lake.....	45,387	
	45,387	208,786
Total distribution.....	254,173	

LESSER SLAVE LAKE HATCHERY

	Pickeral fry	Whitefish fry
Lesser Slave lake—		
Assineau, west of.....	1,200,000	
Auger bay.....	2,400,000	600,000
Dog island.....	1,000,000	
Drift pile point, east side.....		620,000
East of hatchery.....	1,850,000	1,050,000
Faust.....	800,000	500,000
Gerioux bay.....	1,950,000	600,000
Nine Mile point.....	2,300,000	2,800,000
North shore.....	2,800,000	1,365,000
Swan river, 8 miles from hatchery.....		400,000
West of hatchery.....	2,600,000	1,800,000
Widewater.....	2,250,000	620,000
	19,150,000	10,355,000
Total distribution.....	29,505,000	

SPRAY LAKES HATCHERY

(Subsidiary to Banff hatchery)

	Cutthroat trout eyed eggs	Cutthroat trout fry
Rocky Mountain Park—		
Spray river—		
Bay at head.....		56,000
Head of lake.....		24,000
Small creeks.....		24,000
Bryant creek.....		16,000
Hatchery creek.....	60	42,330
Marvel lake.....		16,000
North bay.....		48,530
Smutts creek.....		8,000
Pond—1 mile above lake.....		8,000
Pond—between lakes.....		16,000
Pond—opposite upper trap.....		16,000
Upper Spray lake.....		32,000
Upper Spray river.....		16,000
	60	322,860
Total distribution.....	322,920	

WATERTON LAKES HATCHERY

	Cutthroat trout fry	Cutthroat trout advanced fry	Rainbow trout fry	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 4 fingerlings
Old Man river—						
Alix creek (77 miles from hatchery).....				10,000		
Beaver creek (65 miles from hatchery).....					15,000	
Belly river (S. 4, 9, 16, T. 1, R. 28, E. 5).....	25,000					
Indian creek (S. 30, 32, T. 1, R. 28, E. 5).....	25,000					
Mami lake, (S. 6, T. 1, R. 27, W. 4).....		30,000				
South Fork (S. 4, T. 1, R. 28, W. 4).....		30,000				
Cabin creek (50 miles from hatchery).....				5,000		
Callum creek (85 miles from hatchery).....				10,000		
Castle river—						
Beaver creek (54 miles from hatchery).....			15,000			
Babin creek (50 miles from hatchery).....			10,000			
Carbondale creek—						
No name creek (52 miles from hatchery).....				15,000		
Jackson creek (61 miles from hatchery).....				10,000		
Mill creek (56 miles from hatchery).....			25,000			
No name creek (63 miles from Hatchery).....				5,000		
Screwdriver creek (53 miles from hatchery).....				15,000		
Young creek (60 miles from hatchery).....				5,000		
Coal creek (97 miles from hatchery).....				10,000		
Crows Nest creek—						
Allison creek (S. 10, T. 9, R. 5, W. 5).....	30,000					
Blairmore creek (S. 10, T. 9, R. 4, W. 5).....	20,000					
Burmis creek (S. 2, T. 7, R. 3, W. 5).....	10,000					
Byron creek (S. 5, T. 7, R. 3, W. 5).....	20,000					
Camp creek (S. 20, T. 8, R. 2, W. 5).....	25,000					
Connelly creek (S. 26, T. 8, R. 3, W. 5).....	25,000					
Cow creek (S. 33, T. 8, R. 2, W. 5).....	20,000					
Godfrey creek (S. 33, T. 7, R. 5, W. 5).....	15,000					
Gold creek (S. 19, T. 8, R. 3, W. 5).....	10,000					
Hogan creek (S. 5, T. 8, R. 4, W. 5).....	15,000					
Island lake (S. 12, T. 8, R. 6, W. 5).....	30,000					
McGillvary creek (S. 6, T. 9, R. 4, W. 5).....	10,000					
No name creek (S. 19, T. 8, R. 2, W. 5).....	10,000					
Pincher creek (70 miles from hatchery).....				35,000		
Chipman creek (54 miles from hatchery).....				15,000		
Beauvais creek (50 miles from hatchery).....				10,000		
Spring creek (72 miles from hatchery).....				5,000		
Policeflat creek (S. 14, T. 7, R. 3, W. 5).....	20,000					
Rock creek (S. 13, T. 8, R. 3, W. 5).....	20,000					
Star creek (S. 35, T. 7, R. 5, W. 5).....	20,000					
Todd creek (S. 25, T. 9, R. 3, W. 5).....	30,000					
Ernest creek (75 miles from hatchery).....				20,000		
Heath creek (62 miles from hatchery).....				10,000		
No name creek (69 miles from hatchery).....				15,000		
No name creek (83 miles from hatchery).....				10,000		
No name creek (68 miles from hatchery).....				5,000		
Olin creek (55 miles from hatchery).....				5,000		
Sharples creek (76 miles from hatchery).....				10,000		
Willow creek—						
Burk creek—						
No name creek (111 miles from hatchery).....					5,000	
Harwick creek (115 miles from hatchery).....					15,000	
Lyndon creek (112 miles from hatchery).....					20,000	
Trout creek (113 miles from hatchery).....					20,000	
Burton creek (110 miles from hatchery).....					10,000	
Patterson creek (114 miles from hatchery).....					10,000	
Meadow creek (103 miles from hatchery).....					10,000	
Quail creek (130 miles from hatchery).....					10,000	
St. Mary's river—						
Boundary creek (S. 19, T. 1, R. 26, E. 5).....	20,000					
Lees creek (S. 15, T. 1, R. 27, E. 5).....	30,000					
Tough creek (S. 9, T. 1, R. 27, E. 5).....	25,000					
Waterton river—						
Butcher creek (S. 29, T. 3, R. 1, W. 5).....		20,000				
Cameron lake (15 miles from hatchery).....					40,000	
Lynam creek (13 miles from hatchery).....					10,000	
Carpenter creek (S. 16, T. 3, R. 1, W. 5).....		30,000				
Carthew lake (S. 7, T. 1, R. 30, W. 4).....		20,000				
Cottonwood creek (S. 1, 2, T. 3, R. 30, E. 5).....	30,000					
Crooked creek (S. 35, T. 1, R. 29, W. 4).....		15,000				
Crooked creek (S. 11, T. 2, R. 29, E. 2).....		20,000				
Drywood creek (S. 4-5, 10, T. 4, R. 1, W. 5).....	40,000					
Goose lake (R. 29, T. 2, E. 5).....						
Hardy lake (S. 16, T. 4, R. 30, W. 4).....				10,000		
Hatchery Spring (1 mile from hatchery).....						4,000
Knight lake (S. 15, T. 4, R. 30, E. 5).....		10,000				
Lone Beaver dam (S. 7, T. 2, R. 1, W. 5).....		20,000				
Mill creek.....						
Gladston creek (54 miles from hatchery).....					15,000	
Whitney creek (48 miles from hatchery).....					10,000	
No name creek (46 miles from hatchery).....					10,000	
Pine creek (S. 28, T. 3, R. 29, E. 5).....	20,000					
Riggall lake (S. 10, T. 3, R. 29, W. 4).....		10,000				
Smith creek (S. 10, T. 3, R. 1, W. 5).....		24,500				

MARINE AND FISHERIES

WATERTON LAKES HATCHERY—*Concluded*

	Cutthroat trout fry	Cutthroat trout advanced fry	Rainbow trout fry	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 4 fingerlings
<i>Waterton river—Concluded</i>						
Spring creek (S. 9, T. 3, R. 1, W. 5).....		30,000				
Smith lake (26, T. 3, R. 1, W. 5).....				4,450		
Stoney creek (S. 16, T. 1, R. 29, W. 4).....		20,000				
Trail creek (S. 23, T. 2, R. 30, E. 5).....	6,765					
Windam lake (S. 9, T. 4, R. 30, W. 4).....				10,000		
Yarrow creek (S. 10, 11, 12, T. 3, R. 1, W. 5).....	40,000					
<i>Waterton lakes—</i>						
Bertha lake (S. 15, T. 1, R. 30, E. 5).....					10,000	
Blackstone creek—						
Lone creek (26 miles from hatchery).....					10,000	
Boundary creek (28 miles from hatchery).....					10,000	
Pass creek—						
Sage creek (25 miles from hatchery).....					10,000	
Twin lakes (S. 13, T. 2, R. 2, W. 5).....					10,000	
	591,765	279,500	50,000	249,450	270,000	4,000
Total distribution.....					1,444,715	

ANDERSON LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry
<i>Anderson lake—</i>		
Adlem creek.....		200,000
Beaches.....		499,222
Boulder creek.....		510,000
Cabin creek.....		420,000
Cedar creek.....		210,000
Clemens creek.....		279,659
Falls creek.....		410,000
Granite creek.....		710,000
Ternan creek.....		40,000
<i>Barclay sound—</i>		
Maggie lake (Nanaimo district)—		
Boulder creek.....	441,000	
Hillier creek.....	560,000	
<i>Comox lake.—</i>		
Cruikshank river.....	1,001,000	
<i>Great Central lake—</i>		
Drinkwater creek.....	1,505,000	
<i>Sproat lake—</i>		
Taylor river.....	2,002,000	
	5,509,000	3,278,881
Total distribution.....		8,787,881

BABINE LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings
<i>Babine lake—</i>				
Morrison creek.....		3,200,000	1,146,046	46,475
Morrison lake.....		2,462,000		
Salmon creek.....	300,000			
Talho lake				
Talho creek.....	600,000			
	900,000	5,662,000	1,146,046	46,475
Total distribution.....			7,754,521	

COWICHAN LAKE HATCHERY

	Cutthroat trout	Cutthroat trout	Cutthroat trout	Speckled trout	Spring salmon	Spring salmon	Spring salmon	Spring salmon	Steelhead salmon
	Fry	No. 1 fingerlings	No. 2 fingerlings	Fry	Eyed eggs	Fry	No. 1 fingerlings	No. 2 fingerlings	Eyed eggs
									Fry
Cowichan lake.....									17,000
Cottonwood creek.....	49,000					386,910			35,000
Nixon creek.....	46,000								
Robinson river.....				26,000	50,000	300,000			
Shaw creek.....				18,000					
Sutton creek.....	49,000			23,250	125,000				
Cowichan river.....					100,000	334,500	159,447	59,423	
Beardhall creek.....									14,000
Beaver creek.....				12,000					5,000
Holmes creek.....				15,000					
Mead creek.....									
Nuttall creek.....									14,000
Oliver creek.....									5,000
Wake lake.....	5,744	1,000	1,080	15,000					7,892
Highland District—									
Deadman river—									
Fork lake.....	5,000								
Koksilah river—									
Kelvin creek.....	5,000								
Saanich District—									
John creek.....									
Johnson lake.....	8,000								
Sea—									
Cushim lake.....	5,000								
Ford lake.....	2,500								
Gold stream.....						20,000			
Spectacle lake.....				17,000					
Sooke river—									
Shields lake.....	10,000								
Todd Inlet—									
Prospect lake.....	20,000								
Killamey lake.....	5,000								
	210,244	1,000	1,080	126,250	275,000	1,041,410	159,447	59,423	35,000
									62,892

Total distribution.....1,971,746

MARINE AND FISHERIES

CRANBROOK HATCHERY (a)

	Cran- brook trout eyed eggs	Cran- brook trout fry	Cutthroat trout green eggs	Cutthroat trout eyed eggs	Cutthroat trout fry	Kamloops trout eyed eggs	Kamloops trout fry
Cranbrook District—							
Echo lake.....							5,000*
Moyie river—							
Fish lake.....				85,000			
Fish lake creek.....			15,000				
North Fork—							
Ridgeway creek.....					5,000		
Moyie lake.....					5,814		5,000*
Peavine creek.....			45,000	150,000	30,000		
Tunnel creek.....				30,000			
Mineral lake.....	12,000			42,000		5,000*	
Mineral Lake creek.....				21,000			
Munroe lake.....		16,150			235,000		9,375*
Munroe fish lake.....					20,000		2,000*
Twin lakes.....							
Fernie district—							
Loon lake (Roosville valley).....							7,250
Loon lake (West Waldo).....							9,500
Manistee lake.....							14,500
McBaines lake.....							7,000
Premier lake.....				75,000		12,000	
Rock lake.....							4,800*
Silver Springs lakes.....							9,500
Horseshoe lake.....							10,000*
Kootenay river—							
Bartholomew lake.....				20,000			3,000*
Four Mile lake.....					5,000		
Garbetts lake.....							
Goat river.....				20,000			
Little Bull river.....				20,000			
Lund lake—				7,500			
Rothwell lake.....							5,000*
Phillip creek (near Roosville).....				10,000			
St. Marys river.....					60,000		
Beaver dam.....					145,000		
St. Joseph creek.....				10,000			
Nicomekl river.....				212,000			
Pender Harbour—							
Garden Bay lake.....				10,000			
Rock or Stephens lake.....					25,000		8,000*
Smith lake.....							5,000*
Sunnyside hatchery (Lake Beautiful).....				20,000			
Windermere District—							
Fish lakes.....				12,500			
Creek between Twin and Bott lakes (some- times called Fish lakes).....				12,500			
	12,000	16,150	60,000	757,500	530,814	17,000	104,925
Total distribution.....							1,498,389

* Kamloops trout from Lloyds Creek hatchery. (The balance of Kamloops trout are from Nelson hatchery.)

(a) Operated by Cranbrook District Rod and Gun Club in co-operation with the Federal Department of Fisheries.

CULTUS LAKE HATCHERY

	Steelhead salmon No. 1 fingerlings	Steelhead salmon No. 2 fingerlings	Sockeye salmon eyed eggs	Sockeye salmon fry
Biological Board (Dr. Foerster).....			525,000	
British Columbia University (Mr. R. Pillsbury).....			3,060	
Hastings Park Aquarium, Vancouver.....			7,000	
Cultus lake—				
East creek.....			35,000	
Frost creek.....			1,638,000	
Smiths Falls creek.....			105,000	
Spring creek (Dumville creek).....			371,000	
West creek.....			105,000	
Windfall creek.....			252,000	
Vedder river.....	15,000	24,594		
Sweltzer creek.....	14,515	24,543		3,000
Shuswap lake—				
Salmon Arm—				
Eagle river.....			1,001,000	
	29,515	49,137	4,042,060	3,000
Total distribution.....				4,123,712

Kamloops
trout fry
446,913

HARRISON LAKE HATCHERYKENNEDY LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 3 fingerlings	Sockeye salmon No. 4 fingerlings	Sockeye salmon No. 5 fingerlings
Kennedy Lake—							
Alberni Bay and south.....			250,000				
Charlie Creek to Ucluelet Bay.....			225,000				
Clayoquot Arm—							
At hatchery.....				15,000			
Cold creek.....	107,000						
Duck island and Calm bay.....			215,000				
Fir creek to Silent bay.....			225,000				
Hatchery Beach.....					55,000		
Irvine Creek vicinity.....			175,000				
Lake Shore.....						65,000	40,000
Martin Creek to Peter Creek.....			150,000				
Peninsular Bay to Narrows.....			200,000				
Pond Beach.....	50,000						
Pond Creek.....			65,000	19,000	10,000		
Little Pond Creek.....			57,000	18,000		54,837	
Silent Bay to Deer Beaches.....			60,000			24,322	
Long Island Bays.....			150,000				
Shallow Bay to Sand Creek.....			225,000				
Kennedy River—							
Juanita Lake.....	30,000						
Suttons Slough.....			75,000				
	137,000	50,000	2,072,000	52,000	65,000	144,159	40,000
Total distribution.....						2,560,159	

MARINE AND FISHERIES

LAKELSE LAKE HATCHERY

	Kamloops trout eyed eggs	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 4 fingerlings
Lakelse lake.....			1,111,300		150,000	255,000
Angelus creek.....			60,000			
Beaver dam.....			402,000	250,000	50,000	40,000
Furlong creek.....			240,000			
Granite creek.....			397,000			800
Hoodoo creek.....			135,000			
Hot Spring creek.....			124,000			
Salmon creek.....		228,000	456,000			
Scullabuchan creek.....			428,000			
Slough creek.....			80,000			
Williams creek.....			636,000			
Eliza creek.....		180,000				
Prince George District—						
Six Mile or Christy lake.....	20,000					
Prince Rupert District—						
Cloyah Bay—						
Cloyah lake.....	30,000					
Smithers District—						
Buckley river.....	75,000					
	125,000	408,000	4,069,300	250,000	200,000	295,800

Total distribution..... 5,348,100

LLOYDS CREEK HATCHERY

	Kamloops trout green eggs	Kamloops trout eyed eggs	Kamloops trout fry
Alberni District—			
Somas river—			
Cameron lake.....		40,000	
Great Central lake.....		40,000	
Sproat lake.....		40,000	
Comox lake—			
Panther lake.....		40,000	
Eweings hatchery (sold).....		20,000	
Fish lake.....	130,000		
Fraser river—			
Serpentine river.....		50,000	
Harrison lake.....		20,000	
Japan (sold).....		100,000	
Lost lagoon (via Stanley Park hatchery).....		50,000	
Nicola river—			
Big Fish or Face lake.....		10,000	
North Thompson—			
McGillivray lake.....		10,000	
Moose lake.....		15,000	
Myrtle lake.....		10,000	
Lake Jean.....		10,000	
Tawell lake.....		15,000	
Paul lake.....			200,000
Pinantan lake.....			75,100
Pitt lake—			
Sturgeon slough (via Stanley Park hatchery).....		30,000	
Quesnel District—			
Bridge lake (Cariboo riding).....		20,000	
Sea—			
Link lake (Ocean Falls).....		75,000	
Shuswap lake—			
Canoe creek.....		15,000	
Owl Head lake.....		10,000	
Palmer creek.....		20,000	
Reinecker creek.....		15,000	
Sooke lake—			
McKenzie lake.....		40,000	
Sunnyside hatchery (sold).....		30,000	
	130,000	725,000	275,100

Total distribution..... 1,130,100

NELSON HATCHERY

	Kam- loops trout eyed eggs	Kam- loops trout fry	Kenner- ly's salmon (Little Red fish) eyed eggs	Rainbow trout eyed eggs	Rainbow trout fry	Speckled trout eyed eggs	Speckled trout fry
Arrow lake—							
Inonaklin river.....							20,000
Slocan lake—							
Bonanza creek—							
Summit lake.....	12,500						
Cahill lake.....	25,000						
Evans creek.....	35,000						
Little Slocan lakes.....							20,000
Lower Arrow...							
Syringa creek.....		25,000					
Otopus creek.....	25,000						
Upper Arrow lake (St. Leon).....	75,000						
Upper Arrow lake (Halyceon).....				25,000			
Whatshan creek.....	40,000						
Cranbrook hatchery—							
Moyle river—							
Swansea creek.....						20,000	
Columbia river—							
Beaver creek.....						10,000	
Big Sheep creek.....							22,500
Columbia lake.....	65,000						
Grassy lake.....						25,000	
Lake Eileen.....							25,000
Lake Enid.....							25,000
Lillian lake.....				12,500			
Fernie District—							
Elk river—							
Hosmer creek.....						10,000	
Lizard creek.....						10,000	
McCool creek.....						10,000	
Michel creek.....						10,000	
Morrisey creek.....						10,000	
Kootenay lake—							
Coffee creek.....			40,000				
Crawford lake.....							1,000
Crawford creek.....				20,000			
Corn creek.....						10,000	
Cottonwood lake.....				151,735			
Cultus creek.....			40,000				
Goat river—							
Meadow creek.....						10,000	
Gray creek.....							10,000
Kaslo creek.....							20,000
Kokanee creek.....			40,000				
Lime lake.....							10,000
Loon lake.....							10,000
McGregor lake.....							10,000
Midge creek.....			40,000				
Nine Mile creek (Granite Cr.).....			40,000				
Redfish creek.....			40,000				
Six Mile creek.....			24,000				
Six Mile lakes.....				87,500			
Kootenay river—							
Bear creek.....					20,000		
Bonnington.....					20,000		
Cottonwood creek.....		20,000		18,180			
Grohman creek.....		11,126					
Five Mile creek.....					20,000		
Forty-nine Mile creek.....		20,000					
Slocan pool.....		20,000					
Sproul creek.....		20,589			20,000		
Taghum.....					20,000		
Above Nelson.....					25,674		
Below Nelson.....					20,000		
Pend D'Orille—							
Boundary lake.....							50,000
Long lake.....		25,000					
Sand Creek—							
Smelter creek.....	20,000						
Salmon river.....							23,907
Saunders creek—							
Christina lake.....	40,000						
Kettle river.....							
Boundary creek.....						10,000	
North Fork of Kettle river.....						10,000	
	337,500	141,715	264,000	314,915	145,674	145,000	247,407

Total distribution..... 1,596,211

PEMBERTON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon eyed eggs	Sockeye salmon fry
Birkenhead river.....				18,460,000
Cheakamus river—				
Alta lake.....		23,600		
Daisy lake.....	12,500			
Garibaldi lake.....	12,500			
Howe Sound—				
Phantom lake.....		4,800		
Lillooet lake—				
Adie lake.....				510,000
Seton lake—				
Anderson lake.....				1,020,000
Gates creek.....			300,000	
Gates lake.....				1,360,000
	25,000	28,400	300,000	21,350,000
Total distribution.....				21,703,400

PENASK LAKE HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Fraser river—		
Silver creek (south of Hope, B.C.).....	10,000	
Williams lake (70 miles south of Quesnel, B.C.).....	25,000	
Nicola river—		
Lauder creek—		
Hawkins lake.....	10,000	
Penask lake—		
Neveu lake.....	50,000	
Pefferle lake.....	50,000	30,778
Penask creek.....	200,000	
Wampole creek.....	100,000	
Semiahmoo Bay (or Mud Bay) (south of New Westminster)—		
Serpentine river.....	113,000	
Similkameen river—		
Tulameen river—		
Bear lake.....	10,000	
Burns lake.....	15,000	
Deep creek.....	15,000	
Round or Burgeson.....	15,000	
Stanley Park hatchery, Vancouver, B.C., "B.C. Anglers' Association".....	50,000	
Sunnyside hatchery, at Lake Beautiful, 15 miles from Vancouver, "Sunnyside Trout Farms" (sold).....	25,000	
	688,000	30,778
Total distribution.....		718,778

PITT LAKE HATCHERY

	Sockeye salmon fry	Sockeye salmon No. 2 fingerlings
Upper Pitt river—		
Chas. Peter's creek.....	1,000,000	
Four Mile creek.....	845,143	174,045
Four Mile slough.....	1,000,000	
Mountain slough.....	1,200,000	
Seven Mile creek.....	900,000	
	4,945,143	174,045

Total distribution..... 5,119,188

RIVERS INLET HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 3 fingerlings	Sockeye salmon No. 4 fingerlings
Owikeno lake.....			24,550	24,280
Askum river.....		671,761		
Cheo river.....		792,461		
Dallick river.....	750,000	731,000		
Genesi creek.....	1,939,000	531,000		
Indian river.....		741,888		
Quap creek.....	1,011,000	2,791,463		
Shumahalt river.....	1,476,000	515,111		
Markwell river.....		734,412		
Wauquash river.....		1,121,120		
	5,176,000	8,630,216	24,550	24,280

Total distribution..... 13,855,046

SQUILAX CAMP

Biological Board—Taft, B.C.....	Sockeye salmon green eggs 505,000
Total distribution.....	505,000

STUART LAKE HATCHERY

	Sockeye Salmon		
	Eyed eggs (Landlocked)	Fry (Landlocked)	Fry
Stuart lake—			1,305,000
Cunningham creek.....	(a) 10,250	3,900	
Cunningham lake.....			1,635,000
Grass lake.....			260,000
	(a) 10,250	(a) 3,900	3,200,000

Total distribution..... 3,214,150

(a) Planted from the 1929 Fall collection.

SUMMERLAND HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Speckled trout eyed eggs	Speckled trout fry	Whitefish fry
Columbia river—					
Similkameen river (Co. Yale)—					
Ashnola river.....			20,000		
Clearwater lake.....	20,000				
Le Lievre lake.....				2,500	
One Mile Creek.....				9,850	
Smelter lake.....		25,000			
Tulameen river.....			20,000		
Okanagan river (Co. Yale)—					
Chute lake.....		20,000			
Fish lake.....		15,000			
Kalamalka lake.....		75,000			
Okanagan lake.....		95,850			
At hatchery.....					350,000
Bear creek.....			10,000		
Crescent beach.....					480,000
Deep creek.....					350,000
Glenmore lake.....				5,000	
Greta ranch.....					400,000
Kelowna.....					200,000
Landry's ranch.....					400,000
Mission creek.....			10,000		
Naramata.....					100,000
North of hatchery.....					400,000
Okanagan Centre.....					400,000
Paradise landing.....					200,000
Peachland.....					360,000
Summerland.....					600,000
Trepannier.....					360,000
West Bank.....					80,000
Silver (or Millers lake).....		15,000			
Skaha lake (Dog lake).....		50,000			
Wood lake.....		25,000			
Pend d'Oreille—					
Kettle river (Co. Yale)—					
East fork.....			15,000		
Lake Vale.....	15,000				
McCulloch lakes.....		20,000			
West fork.....			15,000		
Shuswap river—					
Mabel lake.....	75,000				
	110,000	340,850	90,000	17,350	4,680,000

Total distribution..... 5,238,200

APPENDIX No. 4

REPORT OF C. BRUCE, A.M.E.I.C., FISHERIES ENGINEER

CLEARING RIVERS AND BUILDING FISHWAYS

As indicated in the previous report the development of hydro-electric power, involving the construction of dams of much greater heights than was formerly the case, is assuming larger proportions, and is presenting many problems in connection with the provision for the ascent of fish as well as the adequate protection for their descent to the sea.

While efficient fishways have been provided for such developments as have been completed up to the present, where their provision has been considered necessary, it may be that with the construction of some of the major developments which now appear to be pending and which in some instances involve dams of heights of upwards of from 100 to even over 300 feet, situations will be met with in which it may not be feasible to devise efficient fishways. Even provided that fishways in such developments are found to be feasible, consideration will need to be given to several factors among which may be mentioned:—

- (1) Provision for the descent of seaward migrants.
- (2) The possibility that, due to the altered conditions above the dam by the flooding of areas which previously provided spawning grounds, these may to a great extent be eliminated.
- (3) The possibility that the expenditure for the provision of a means for the passage of fish may greatly exceed the value of the fishery.

With the modern power development the necessity for a uniform flow of water, in order that the plant may be operated at full capacity throughout the year, has led to the provision of storage whereby the freshet waters are held and let down as required. There is, except during heavy freshets, usually little if any discharge from the power dam, with the exception of the water passing through the turbines. Under these conditions the chances for seaward migrating fish passing the dam uninjured are greatly reduced, particularly in the case of the young ones. Screens, to prevent their entrance into the turbines, have been tried, but without marked success, owing to debris collecting on the screen surfaces. In one instance at least it was found as well that the screens were causing considerable loss from the young fish being drawn against them and injured. Some experimental work has been carried out with what are known as electric screens, the purpose of which is to electrify a field extending across the opening to be screened. While these screens have been developed with some success for smaller channels, their efficiency in the large forebays of power developments has not as yet reached a stage where their adoption can be considered.

The removal of obstructions to the ascent of migratory fishes in streams and rivers was carried on throughout the year as occasion demanded.

The following works were undertaken in connection with building fishways and clearing rivers:—

NOVA SCOTIA

Medway River, Queens County.—The approach to the fishway in the dam at Salters falls was repaired with stone and concrete.

Gold and Middle Rivers, Lunenburg County.—The beds of these rivers for several hundred yards above the mouth are flat in contour and strewn with

boulders. It was found that during lower stages of water salmon were unable to ascend owing to the flow being spread out and broken up. Boulders were removed for a width of approximately six feet, extending through these areas, thus providing continuous, unobstructed channels in which the flow of water was concentrated, thereby facilitating the passage of fish.

La Have River, Lunenburg County.—The fishways at Bridgewater were inspected. Arrangements were made with the owner of the DeLong dam on the North branch to improve the fishway. A channel was opened up around the end of a small dam on the same branch to provide a fishway.

Petite Riviere, Lunenburg County.—The channel of the river below the fishway, in the Conquerall Mills dam, leading thereto, was deepened, and some improvement made to the fishway itself, to facilitate the ascent of alewives.

Mersey River, Queens County.—Inspections were made of the three power developments under construction by the Nova Scotia Power Commission, and the question of the advisability of requiring fishways therein carefully gone into. After due consideration, the department decided that for the present, and until conditions created by the dams could be studied and definite knowledge of the effect which they will have on the fishery obtained, a fishway would be required in the lowest dam only, there being several tributary streams between this and the next dam above which may provide spawning grounds. Designs were prepared by the engineers and the fishway therefrom was subsequently built by the Power Commission. This fishway overcomes a vertical height of fifty-nine feet, and is over eight hundred and fifty feet long. The vertical height overcome is the greatest in which a fishway has, up to the present, been built in Canada.

Tusket River, Yarmouth County.—Inspections were made of the power development under construction by the Nova Scotia Power Commission on this river, and designs prepared for fishways both in the diversion dam in the main river, having a height of fifteen feet, and in the intake dam at the power house, having a height of approximately twenty-seven feet. These fishways were subsequently built by the Power Commission, but owing to divergence from the design in the construction of the latter, it will be necessary to require modifications.

Gasperaux River, Kings County.—The fishway in the power dam on this river, which overcomes a height of approximately thirty-two feet, had become so rotted that it was necessary for the owners to entirely rebuild it. The original height of this dam was thirty feet, but subsequently this was increased as above stated, with the result that during higher stages of water it was not practical to adjust the inlet of the fishway. Plans of modifications to meet the altered conditions were prepared and incorporated in the new fishway with satisfactory results.

Plans were prepared for fishways in two small storage dams at the outlets of Gasperaux lake and the construction in connection therewith completed.

Porters Lake, Halifax County.—A channel was opened through the beach at the outlet of the lake to permit the descent of fish to the sea. Similar channels were opened up at the mouth of Round Bay river, Shelburne county, and at Gasperaux pond, Oyster pond and McInnis pond, in Victoria county.

Tangier River, Halifax County.—Inspections were made into conditions for the ascent of salmon and arrangements concluded for the provision of a fishway in a small dam at Mooseland.

Fish and Moose Rivers, Halifax County.—Inspections were made of dams on these rivers, and arrangements concluded with the Hollingsworth Whitney Company, Limited, to provide suitable gate openings for the ascent of the fish

in their driving dams on the first named river. Moose river is a smaller tributary of Fish river, and on account of the number of dams it was not considered that for the present fishways should be required. The provision made on Fish river will allow fish to reach suitable spawning grounds.

Osier River, Halifax County.—An inspection was made and plans for a fishway to meet altered conditions at the dam owned by Messrs. Hubley and McDonald were prepared. This fishway was subsequently built and proved effective.

In a number of instances where obstructions, consisting of jams formed by accumulations of old logs and rubbish, had formed in streams during freshets, these were removed under the supervision of the inspectors in whose districts they occurred. The following streams received attention: Black brook, McDonald's Lake brook, Loon Lake brook, in Cape Breton county; McNeill's brook, Victoria county; McKinnon's brook, Lake O'Law brook, McLennan's brook, Big Meadow brook, Glen brook and Sky Glen brook in Inverness county. Two rock falls which prevented the ascent of salmon in North river, Victoria county, were blasted to improve conditions.

Screens were erected covering the fishways in dams on river Phillip and South river, to prevent poaching and a screen was placed again this year to prevent the ascent of salmon into the tailrace channel, at the Barrington River woollen mills.

Inspections by the engineers were made of fishways on the Roseway, Jordan, Clyde, Ship Harbour, and Sheet Harbour rivers.

NEW BRUNSWICK

New River, Charlotte County.—At the Keyhole falls on this river the channel is divided and during low water salmon entering the smaller one become stranded. A small concrete dam was built at the head of this channel to close it off entirely.

Improvements were also made to confine the flow of water in one channel, by blasting, at Crooked falls and Scott's falls.

Long stretches of this river are through thickly wooded country, which makes it difficult for guardians to reach many of the pools in which salmon lie, and where poaching is likely to occur. This condition was much improved by opening up a foot trail along the river.

Pocologan River, Charlotte County.—A trail similar to that provided for the New river was opened up along this river to facilitate guardianship.

Magaguadavic River, Charlotte County.—The lower end of the fishway at St. George, which overcomes a vertical height of forty feet, was completed during the year.

In addition to the works above stated, the following were undertaken by the engineers:—

Inspection and survey for a fishway on the Magaguadavic river at Flume ridge.

Inspection and survey for a fishway over the falls at the mouth of the Lepreau river.

Inspection and instructions to owners regarding repairs to the fishway at Great Salmon river, St. John county.

Inspection and survey for modifications to fishway at Salmon river, Albert county.

MANITOBA

Red River, St. Andrews Locks.—Modifications were completed by the Public Works Department to the fishway in this dam, from designs by the fisheries engineer.

Whitemud River.—While the fishways previously built in dams on this river at Gladstone and Westbourne were effective in so far as design was concerned, conditions were such below the dams that suckers would not seek the entrances to them except in small numbers. It was accordingly arranged to have large stop-log gates installed in the dams, which can be removed during the short period when these fish are ascending.

Winnipeg River, Great Falls.—An inspection was made and data secured in connection with the proposal that a fishway should be installed in the Winnipeg Electric Company dam at this point.

BRITISH COLUMBIA

All work in this province is under the direct supervision of Resident Engineer J. McHugh, under whose direction the following waters received attention, embracing the removal of log jams and rock obstructions, which either hindered and delayed the passage of salmon to their spawning grounds, or else entirely prevented such passage: Fraser creek, Carriden Bay creek, Easy creek, Ka-oo-winch river, Yakoun river, Serpentine river, Campbell river, Bulkley river (Moricetown), Penask creek and Oyster river.

In addition to the foregoing, minor obstructions, consisting of accumulated logs and roots, were removed from certain other streams, the work being performed under the direct supervision of the local inspectors. The streams on which these works, mostly performed in remote places, and not requiring engineering advice in their performance, are listed below as follows:—

Capilano river, Atuarko river, Hobartin river, Salmon river, Knouff creek, Doriston creek, Hyacinth creek, Ian river, Justakla creek, Crawford creek, Bear creek, Coal creek, Canoe creek, Bednesti creek, Simpsons creek, Little river, Open Bay creek, Williams creek, Marble creek.

All such minor obstructions are now dealt with in this manner, after reports and recommendations in connection therewith have been submitted to the office of the resident engineer. This method has resulted in a great saving in expenditure and allows the engineers greater freedom for other duties.

Cowichan River, Skutz Falls.—Designs were prepared in the Resident Engineer's office for a fishway to overcome the natural obstruction to the ascent of salmon at this falls.

Consideration was also given to the question of providing fishways for high dams which are proposed, both at Stamp falls, on Stamp river, and Shuswap falls, on the Shuswap river. While in the case of the former additional data was secured on the ground, nothing that could be recommended has as yet been developed.

FISH CULTURAL ESTABLISHMENTS

Antigonish Hatchery.—The entire hatchery property was enclosed with a wire fence, with ornamental concrete gate posts and picket gates. A layout plan was prepared for the improvement of the grounds and considerable work done during the year.

Bedford Hatchery.—Designs were prepared for a small rearing pond system at this hatchery, which will, when finally completed, comprise fifteen ponds. During the year three of these were built under direct supervision of an engineer. The dimensions of ponds built are, lengths—29 feet, 31 feet 6 inches and 34 feet 6 inches, the widths of all ponds being 4 feet, and the depth grading from 14 inches at the head, to 15 inches at the foot, with a portion five feet long at the lower ends 21 inches deep to permit cleaning. The system includes a head trough and foot trough, all work being reinforced concrete.

Yarmouth Hatchery.—The rearing pond system was extended by the construction of seven ponds, each 150 feet long, 4 feet wide, and $2\frac{1}{2}$ feet deep. Each

pond is subdivided at thirty-foot intervals in the length by buttress walls, between which screens may be placed as desired to separate the different sections. All work is done with reinforced concrete. A store-house, 20 feet by 24 feet, was built at the back of the garage. The grounds surrounding the hatchery buildings were graded and the general appearance greatly improved.

Middleton Hatchery.—The sills and lower ends of the studding in the walls of the hatchery building were renewed.

St. John Hatchery.—Four new, reinforced, concrete rearing ponds, each 175 feet long, 4 feet wide, and $2\frac{1}{2}$ feet deep, were built, and general repairs made to some of the walls of existing ponds. The dwelling was painted, and a new verandah built across the front. The platform in front of the hatchery was renewed with concrete, replacing the old wooden one.

Margaree Retaining Pond. The cribwork forming the walls of the pond was renewed, and resheathed. The old work had completely rotted out down to water level.

Miramichi Hatchery.—Sanitary plumbing, including bath, basin, closet and hot water boiler, was installed in the dwelling, with a septic tank for sewage disposal. The water supply is obtained from the hatchery creek by a hand-operated pneumatic pressure system.

The old stable, ice-house and coal-house, which had rotted beyond repair were demolished and a new storehouse, 40 feet long and 16 feet wide, built to replace them. This building contains as well an ice-house and feed room. The old store-house was remodelled to provide garage space for the hatchery truck and a coal room.

Tobique Sub-Hatchery.—The old water supply dam was replaced by a new one, located seventy-five feet further upstream. The dam is built of cedar logs with plank sheathing.

Florenceville Hatchery.—A store-house, 16 feet by 18 feet, was built adjoining the garage building.

A new earthen pond was excavated at the front of the hatchery property, and the existing earthen pond was enlarged and deepened.

Considerable work was done in grading and improving the hatchery grounds, and a new tile drain was laid from the feed room to the creek.

Kelly's Pond Hatchery.—The water supply dam was repaired by entirely renewing the waste gate and sluice with heavy timber and sheathing. The supply pipe to the hatchery, which had become badly corroded, was renewed, two 6-inch wood stave pipes installed.

Sanitary plumbing was installed in the dwelling with a septic tank for sewage disposal. As there was no available room, a small ell was built on the back of the building to provide a bathroom. The water supply is obtained by a hand operated pneumatic pressure system.

Gull Harbour Hatchery.—Modern, single feed, unit batteries were built to replace the old U-type battery. The new batteries have a capacity of seven hundred and eighty hatching jars. The concrete floors were repaired and resurfaced, and new floor tanks were built.

Waterton Lakes Hatchery.—Six rearing ponds, four of which are fifty feet long, one eighty feet long, and one one hundred feet long, were excavated on the sloping ground back of the dwelling. The water supply was obtained by placing a small dam in the hatchery creek, and running a wooden flume 160 feet long. A combination ice-house and double garage, 18 feet by 32 feet, was built, and an office and living room provided in the end of the hatchery building. Considerable improvement was made to the hatchery grounds, and an ornamental stone wall was built along the front of the property.

Banff Hatchery.—A rearing pond, approximately one-quarter of an acre in area, was excavated. The water supply, brought in from both glacial and warmer mountain streams, thus providing a measure of temperature control, is controlled by valves.

Lakelse Lake Hatchery.—A new spawning fence was constructed at Williams creek, for use in connection with the operations of this hatchery. This construction necessitated the cribbing of the adjoining stream banks for a distance of 375 feet.

Babine Lake Hatchery.—A boat house, 16 feet by 36 feet, was built with marine ways 110 feet long, fitted with cradle and capstan to provide for hauling the hatchery boat out for the winter.

Cowichan Lake Hatchery.—The dam at the water works intake was reinforced and new spillways constructed thereon.

Penask Lake Hatchery.—A new eyeing station was built at Penask lake, consisting of an open building to accommodate five million trout eggs, and a cottage containing a combined living room and dining room, and four bedrooms. The water supply is conveyed to the hatchery by a flume 800 feet in length.

Owing to the isolated location of this station, many difficulties were experienced, particularly in respect to transportation, all material having to be brought in a distance of between fifty and sixty miles over very indifferent roads.

Cultus Lake Hatchery.—A survey was made of Sweltzer creek for the purpose of determining the location of certain pools, the construction of which is contemplated for holding salmon below the spawning fences. A new fence and pens were constructed in the creek bed for the purpose of segregating the various runs of fish.

INVESTIGATIONS AND SURVEYS

Malpeque Bay, P.E.I.—A complete survey of Malpeque bay was made by an engineer of the Topographical Survey, in co-operation with the Fisheries Engineer, for the establishment of areas to be leased for oyster culture. Permanent monuments were established at suitable intervals around the shores of the bay from which the areas may be located.

Margaree Salmon Pond.—An examination was made of the waters of Margaree harbour, and surveys conducted for the establishment of a tidal salmon retaining pond.

Morell River, P.E.I.—A survey was made of a proposed site for a salmon retaining pond on the Morell river.

Cochin, Sask.—Surveys were made of proposed sites for a whitefish and trout hatchery at Cochin, on Jackfish lake, Saskatchewan.

Fraser River, B.C.—Under supervision of Resident Engineer McHugh, conditions on the Fraser river at Hell's gate and Bridge River rapids received attention from time to time as occasion demanded. An instrumental survey of the Bridge River canyon is being completed, in order that information may be available in connection with any additional work that may be considered advisable at this point to facilitate the ascent of salmon.

GENERAL CONSTRUCTION

Digby Island, B.C.—Under supervision of Resident Engineer McHugh, complete plans and specifications were prepared for the construction of marine ways and covered shed, a warehouse measuring 50 feet by 30 feet, with living quarters for watchman, and sheds for the winter housing of nine fisheries patrol boats. The land was obtained from the provincial Government without cost and the above work completed by contract. This construction provides a long-

felt want in the northern district whereby the patrol boats may be drawn out of the water, repaired and painted by the department's own employees. Ample space is provided in the warehouse for the storage of departmental property and confiscated fishing gear.

BIOLOGICAL BOARD OF CANADA

Fisheries Experimental Station, Halifax, N.S.—Designs were prepared and a contract awarded for the construction of a new station at Kings wharf, Halifax, N.S. The building measures 44 feet by 85 feet, and is three stories high with attic. Accommodation is provided for fish handling, aquarium, fish culture, experimental work, museum, library, offices, lecture room, board room, and laboratories for instruction, biochemical, chemical and bacteriological purposes. The building is reinforced concrete construction, the exterior walls being tile with brick facing. A hot water system is provided for heating, and the building is complete with plumbing and sanitary fixtures on each floor.

Residence Building, Departure Bay, B.C.—This building was completed during the early part of the year, under the direct supervision of the resident engineer.

Biological Building No. 2, Prince Rupert.—Designs were prepared for a building measuring 36 feet by 80 feet, containing full basement, first and second floors, and attic, in connection with the Fisheries Experimental Station at Prince Rupert, under the supervision of the resident engineer. The basement will contain the heating plant, vault, and refrigerating machinery; the two main floors will be divided off into offices, laboratories, library, workshop, darkroom, etc., while the attic will contain ventilating fans and other miscellaneous equipment. Foundations of the building will call for the excavation of a considerable amount of rock and the entire foundation walls will be of reinforced concrete.

A contract was awarded for a portion of the construction work during the closing stages of the year, and the work is still in progress. Acknowledgment is made of considerable assistance in the preparation of the plans by Mr. O. C. Young, of the staff of the Experimental Station.

McClinton Creek, Counting Fence.—A survey of the streams draining into Masset inlet was conducted, with a view to determining the creek most suitable for the initial investigation into the life history of the pink salmon. McClinton creek was chosen, and the necessary data procured for the construction of a counting fence along similar lines to that at Cultus lake. Plans of the fence, as well as those for the necessary buildings to accommodate the workers, were prepared.

Piper's Lagoon.—Plans were prepared for a combined dam and fence to be installed at Piper's lagoon, in the vicinity of Departure bay, B.C., for the purpose of retaining young salmon in sea water.

GENERAL

Various plans and maps, in connection with fisheries work, were completed during the year, both at headquarters and in the British Columbia office, where the district maps in particular were kept up to date by the addition of material and information furnished by the local inspectors from time to time.

The Engineering Branch also arranged for setting up aquaria in which live fish were shown at the Fishermen's Exhibition at Lunenburg and at the Yarmouth Exhibition.

An inspection was made by Engineer McHugh during the year of certain counting fences in the streams of southern Alaska for the purpose of procuring information on the current practice with regard to such work.

APPENDIX No. 5

SCALLOP INVESTIGATIONS IN 1929

REPORT OF INVESTIGATIONS BY SS. "MADELINE A" OFF SHELBURNE AND QUEENS COUNTIES, NOVA SCOTIA

By H. S. LeBlanc, Observer

Shelburne county investigations were carried out during July, August, and September in and about Green harbour and bay; Jordan river and bay; Cape Negro harbour, both sides of the channel well up to the entrance of Port Clyde; Shelburne harbour and bays; Ragged islands and bays; Sable river and bay; and the offshore grounds from Shelburne, Lockeport and as far east as Port LeHebert.

The best results on these grounds were obtained at Cape Negro harbour, well up to the entrance of Port Clyde, and close in to the shore of what is known as Northwest harbour. Some scallops were also found in the Western passage. The bottom there is very rough and the water shallow.

At Port LeHebert scallops were dragged up along practically the whole length of the harbour.

At Shelburne, some scallops were found on the west side of the harbour close to Hart point and near the entrance to the channel leading to Birchtown.

The scallops found at Cape Negro, Shelburne and Port LeHebert were of good size. These areas would seem to be fairly good grounds for the fishermen to try.

On the offshore grounds off Shelburne, Lockeport, and as far east as Port LeHebert, no scallops of any size could be located—only very small sized scallops as were found last year off Shelburne. These scallops do not appear to grow any larger, unless growth occurs on some other grounds that the investigation could not discover.

QUEENS COUNTY

Queens county investigations were carried on during October and November on the offshore grounds from Port LeHebert to Port Medway and also in the following bays and harbours: Port Joli, Joli Point, Port Mouton, Western and Eastern channels; White Point; Eastern Head; Eagle bay; Coffin Island; Hill bay; Gull bay; and Port Medway harbour.

No indications of scallops could be found on the offshore grounds and bays. It does not seem that the right kind of bottom can be found on these grounds as at every place where draggings were made, only very clean, small rocks would be brought up.

At Port Mouton harbour, both western and eastern channels, the draggings brought up some large scallops. Some very large sized scallops were also found at Port Medway, but it does not appear that either at Port Medway or Port Mouton can enough be found to make operations profitable. At both harbours, the bottom is very rough and the channels narrow so that it was difficult to make draggings with a boat the size of the *Madeline A*.

REPORT OF INVESTIGATIONS BY SS. "ALBERTON" IN WATERS OFF PRINCE EDWARD ISLAND

By Captain S. A. Young, Observer

The scallop investigations of 1929, off Prince Edward Island, were carried on from July 18 until November 29, and fell into three divisions:—

(1) Exploratory work in locating scallop areas in the St. Lawrence off the northeast and east coast of Prince county;

(2) Investigations in the northeast extremity of Northumberland strait, off the coast of Miminégash, Prince county;

(3) Exploratory work in locating areas in Northumberland strait off Charlottetown, Wood island, Murray harbour, and Georgetown, Queens and Kings counties.

All told, draggings totalling 233,610 yards were carried on, yielding 5,265 scallops. The operations by areas were as follow:—

	Yards	Scallops
Alberton and Malpeque.....	120,810	3,662
Miminégash.....	18,600	45
Charlottetown.....	30,900	527
Wood Island.....	15,300	166
Murray Harbour.....	26,700	329
Georgetown.....	21,300	536
	233,610	5,265

The sea bed, in general, off the coast of Prince Edward Island, where exploratory work was engaged in, consisted almost entirely of loose rocks and rock ledges until reaching a depth of about 11 fathoms, when it was found to take on the nature of red sandstone, in some cases making a composition of sand, gravel, shell rock and mud. On the whole there was the form of sea bed on which scallops will exist and thrive.

In the work of investigation it was found that a large number of scallops had recently died. This was most noticeable in the Northumberland strait areas. There was every indication that scallops had become so numerous through lack of fishing that the older ones, reaching the end of their natural life, died and in their decomposed state created a germ which was injurious to the younger scallops.

Scallop bivalves will collect spat for a period of one year in these areas; after that time, they collect a coating known as "marine growth" which helps to decay the valves; the valves decaying, produce an obnoxious odour that has a tendency to attract starfish, helix snail and other fish of similar species. After this has continued for about three years the scallop valves are completely demolished. Instances of this kind have been noted in Mahone bay waters, where scallop valves were put into shallow depths; the starfish, sea urchins, and sand dollars would find these places congenial haunts until the valves were completely decayed.

In the scallop areas off Wood island, Murray harbour, and Georgetown, the investigations revealed indications that the scallops were coming back in goodly numbers. A quantity of very small scallops was found among the empty bivalves.

THE PHENOMENON OF SPAWNING

Scallops were examined carefully from August 31 to September 7 and out of the collection obtained in the draggings only 2 had been in a state of spawning. There were indications that the remainder would carry well on until the middle of September. Scallops were also examined carefully from September 28 to October 5, and it was found that a few carry over in the early days of October. By October 5 the scallops were completely through spawning.

Over the entire sea bed, spawning set in, as stated in Mr. Andrew Halkett's former report, about September 17 and by the 28th spawning was apparently over. In Mahone bay waters, the spawning period is the same as in the Prince Edward Island area.

MURRAY HARBOUR AREA

Draggings were carried on in the Murray harbour area in the period from November 4 to November 13. Thirty draggings were made—each of them 900 yards, with one exception—yielding a total of 329 scallops.

It was found that the sea bed off the Murray harbour coast comprises large areas of rock and shell rock ledges until a depth of 11 fathoms is reached. Seaward beyond that depth, the bottom is evenly balanced areas of gravel, sand, clay and mud, with small areas of broken bottom, including rock and shell rock. On this vast area, scallops had died in numerous quantities but indications were that there should be quite an improvement in this region in the next few years.

GEORGETOWN AREA, CARDIGAN BAY

Draggings totalling 21,300 yards in the Georgetown area from November 14 to November 27, brought up 536 scallops.

Off the coast of Georgetown the sea bed consisted of a rock and mud area extending outward until a depth of about 11 fathoms was reached. From this depth seaward as far as observation work was engaged in, the sea bed was practically of the same kind as in the Murray harbour area, consisting of large stretches of sand and gravel, with a mixture of black quahaug and other mollusc valves. Small areas of rock and mud were also found mixed with this form of sea bed. Though a considerable percentage of scallops in this area had died recently enough were found to have survived to continue production in commercial quantities.

The living scallops and the empty, unhinged bivalves were of a smaller run than those obtained off Murray harbour or Wood island; there were few scallops in this area that would exceed 5 inches. They were of a very even run, measuring from 3 to 4 inches and were of a clean nature. Scallops that had died in this area averaged about 75 per cent and what would be classed as small. The investigations indicated that fishing is the only course to take to prevent scallops dying every few years.

ALBERTON, HARDY'S CHANNEL, AND MALPEQUE AREAS

The exploratory work in the Alberton, Hardy's channel, and Malpeque areas was a continuation of that formerly carried on by Mr. Andrew Halkett. Beginning at the point where Mr. Halkett's exploration had finished, the investigation proceeded along the sea coast in a southeast direction toward East point. The method adopted in dragging was practically the same as that employed by Mr. Halkett. All told, the draggings totalled 120,810 yards, and 3,662 scallops were obtained.

In measurement, the scallops found were not as large as those in Mahone bay waters but when shelled, the mussel of a 4-inch scallop was about the size of a 5-inch scallop in the Mahone bay area. Being of a more even run, the scallops in this region shelled out approximately on the same average as those obtained in Mahone bay waters.

The sea bed off the Alberton coast, where exploratory work was engaged in, was found to consist of large areas of loose rocks and rock ledges extending seaward to 8 and 10 fathoms. Beyond that depth, the seabed took on the form of sand with intervals of loose stones, gravel and shell banks, and small mud and clay areas. The scallops, spread practically all over the sea bed, were found in large quantities on sand and stone bottom, but it was noted that where the large shell banks existed scallops were most plentiful. There, after spawning has been over for some time, young scallops attached to the interior of black quahaug and giant clam shells can be found in every dragging. These valves seem to stay on the sea bed for years in a perfectly clean

state and scallops thrive around the shallow banks. It was also found that scallops were plentiful where gray gravel banks existed. They are also sometimes obtained near mud banks, where the banks gradually fall off and take on the nature of a fine sand. The common buckie, known to fishermen as the helix snail, thrives in these mud areas and are apparently more destructive to the scallops than the five rayed starfish.

It was noted in the exploratory work that the mud areas off the Alberton district are much unlike those in Mahone bay waters. In Mahone bay, the mud consists of a mixture of heavy grey clay with sand, whereas off the Alberton coast, it is almost a muck.

Through almost all the draggings a large number of empty unhinged scallop bivalves was among the scallops, destruction having been caused by five rayed starfish and the common buckie. Fishermen reported that in certain spots they obtain in each dragging quite a number of scallops in a partially decomposed state, and the investigation revealed numerous cases in which the mussel of the scallop had been partly eaten away. Empty scallop bivalves brought up were of clean appearance indicating that the scallops had died or had been killed recently. Examinations and study pointed to the common buckie as the cause of the destruction. In many cases, one, two or three of these buckies were inside the bivalves of the scallops, which were still living, but had small holes eaten in the mussels. The outer portion of such scallops would be in a perfectly normal condition, so that apparently the buckies feed directly on the mussel.

Areas where the Alberton scallop boats had been fishing and when the beds had been dragged clean and the large scallops caught up, were found to be covered with numerous small scallops from two to three inches. It would appear that dragging and cleaning the sea bed makes it more suitable for scallop growth. Areas that had been fished out two years previously were completely covered with young scallops and the beds extended over a much larger area than formerly.

Almost all the scallops obtained in draggings off Goose harbour were large sized with large sponges attached to the deep valve. The small scallops obtained in these draggings were free from sponges. The scallops with sponges attached were practically as far advanced towards spawning as those in other areas off the coast, and were equally healthy.

Off Hardy's channel the sea bed was found to consist of a fine sand out to a depth of 7 fathoms. From that depth out to 15 or 15½ fathoms were large ridges of rock and shell rock ledges with small areas of sand. Some scallops were obtainable in these sand areas, but the indications were that scallop fishing could not be worked up to a paying proposition until fishing boats were beyond 15 fathom depth. From 15 fathoms outward the sea bed was well suited to scallops, which were present in fair quantity.

The sea bed extending southward from Hardy's channel to Hog island in the entrance of Malpeque harbour was found to be practically the same as off Hardy channel—rock ridges and shell rock ledges. This form of sea bed extended seaward to 13 fathoms. Scallops obtained in this area were generally of a small order, clean, and about two years of age.

Rock and shell ledges were found to extend off Malpeque harbour from 7 to 14 fathoms, with small areas of sand and mud. In these areas the sea bed was covered with starfish, snails, etc. Few scallops existed here. Extending seaward from the 14-fathom depth the bottom was good and evenly balanced. There were indications that the accumulation of scallops off Malpeque harbour was just beginning. Where the observation work ended, south of Malpeque harbour, it was noted that the sea bed was beginning to take on a more evenly balanced nature. Extending east southeast toward Cape Tryon there appeared to be a much larger scallop area with less rock and rock ledges.

MIMINEGASH

Exploratory work off the northwest coast of Prince county was carried on over part of the area formerly covered by Mr. Andrew Halkett, and the prime purpose was to ascertain the truth of reports that scallops were dead in areas off Miminegash. The length of the draggings totalled 18,600 yards, and in these areas the scallops have died in large numbers since exploration was engaged in by Mr. Halkett in 1927, information obtained indicating that the scallops died shortly after spawning in September, 1928. The rapidity of the destruction and the number of scallops destroyed indicated that some destructive factor other than the buckie and starfish had been at work. There was apparently support for the view that the scallops having become too numerous, and the beds not being worked by the fishermen, a large percentage of the scallops, having lived through their natural life, died and from their decomposed condition a germ resulted that was injurious to the younger run. Most of the scallops that had survived were nearly in spawning condition and some of the 1929 spawning had developed.

The sea bed in this area was found excellently suited for scallops, and the healthy condition of the young scallops was regarded as an indication that satisfactory multiplication was beginning again.

CHARLOTTETOWN HARBOUR AND AREAS

In the Charlottetown harbour region very satisfactory signs were found of scallops existing at the entrance of Elliott river and inside the entrance. The sea bed in this territory appeared to be very suitable. Scallops that were examined were small and apparently old, but were perfectly healthy, and there was no apparent reason why multiplication should not take place.

Charlottetown harbour scallops were of fair size and in fair abundance, existing all over the sea bed. The draggings indicated the presence of scallops in commercial quantities, but since the area of sea bed is comparatively small it seemed doubtful if the industry would stand much of a strain through continual fishing.

Off Charlottetown harbour the sea bed, where exploratory work was engaged in, was found to consist of a soft mud where scallops would not thrive. Where draggings were made off St. Peter's island, the sea bed was a rock area until a depth of 5 or 7 fathoms had been reached. Seaward beyond that the sea bed took on suddenly the form of mud and muck.

WOOD ISLAND OR SOUTH POINT AREA

Some scallops were found in the Wood island or South point area and in a perfectly healthy condition. The large number of empty scallop bivalves and scallop valves that were brought up in every dragging indicated that scallops must have been present in numerous quantities some few years ago. The clean condition of the empty bivalves and valves indicated that the scallops must have died very recently. After the dead valves have decayed and the sea bed has become clean, it may be expected that the scallops will multiply rapidly in this area.

The sea bed off Wood island was found to consist of a rock area extending outward to 5 and 9 fathoms, with small areas of sand and mud. Beyond the 9-fathom mark, as far seaward as exploratory work was engaged in, the bottom was ascertained to be of a nature excellently suited for scallops.

APPENDIX No. 6

SUMMARY OF OYSTER INVESTIGATIONS IN 1929

By A. W. H. Needler

Oyster investigation work in Prince Edward Island was commenced on June 15. The first two weeks were spent chiefly in exploratory work, Bideford river being selected as the most promising river for the following reasons:—

1. Bideford river is part of the Malpeque Bay area which was formerly the most productive river of the Canadian oyster industry, and is the most likely to be leased for cultivation.

2. Bideford river and Grand river are the only two areas in the Malpeque region where there is any considerable quantity of oysters, and Bideford river itself has many more than Grand river.

3. Bideford river is as close as Grand river to Curtain island and the outer oyster areas in Malpeque bay and is closer to the open gulf.

4. Bideford river is close to a railway station (two miles) and only ten miles from oyster areas on the south shore of the island.

5. Bideford river has a variety of water conditions and various small creeks suitable for complete and detailed records of the hydrography, oyster food, oyster enemies, etc.

OBSERVATION OF SPAWNING AND DISTRIBUTION OF SPAT

As soon as a decision was reached to concentrate in the Bideford area arrangements were made to place about 750 bushels of clean shells in galvanized wire baskets, to make observations of the temperatures, and to observe the oysters themselves. Owing to delays it was not possible to have the regular or complete series of the temperatures at the time of spawning, which took place about July 15 at the head of Bideford river; that is, when the temperature reached approximately 20 to 22 degrees Centigrade. The spat was first observed in the shells on August 7. Plankton nets were not available until too late to find larvæ, but observation suggests that from two to three weeks approximately is the time occupied in the free larval stage. The cultch was put out in the period from July 25 to July 30. More spat continued to appear until about August 20. After that date none was observed in the early fixed stages.

It was found that spat appeared on the clean shells everywhere in the upper two miles in Bideford river. The concentration was greatest from one to two feet below an ordinary low tide, decreasing to zero just above an ordinary low tide and to one-quarter or one-half the maximum in fifteen feet.

The clean shells showed as many as forty to one mussel shells when none could be found on adjacent "natural" shells. The cultch used consisted of 500 bushels of mussel shells which had been ashore for two years and 250 bushels oyster shells which had been ashore for two weeks; the "natural" shells had not been moved. It was found that very little difference existed between sets on the mussel shells and on the oyster shells, but that on the former the spat did not penetrate at all into the centre of the bags (12 inches in diameter), while in the latter case even the innermost shells had a good set.

PREPARATION OF STOCK FOR EXPERIMENTAL PURPOSES

Two small beds were cleaned and sixty barrels of large oysters planted upon them at a density of about 1,500 bushels to an acre. The beds will be observed further next year. About half of the spat obtained this summer was planted thickly on clean beds, the remainder was left in situ.

HYDROGRAPHY

Regular temperatures and water samples were taken in the Bideford area throughout the season and several expeditions were made to the outer parts of Malpeque bay. In addition some data were collected at Percival river on the south shore, the East river (Hillsboro river), at Charlottetown, and at Savage harbour. This material showed that the water reached a temperature of 70° F. everywhere in the areas examined and mounted as high as 85° F. at the heads of the creeks in Bideford river.

A large number of observations were accumulated on the distribution of oysters of various sizes in Bideford river and elsewhere in the Malpeque area, at Percival river and in Hillsboro river. Observations were also made on other subjects concerning the oyster including the presence of starfish, and a start was made at taking plankton samples.

SPECIAL WORK FOR FISHERIES DEPARTMENT

At the request of the Department of Fisheries a brief investigation was made as to the possibility of restocking Savage harbour. The bottom was found to be suitable and in so far as could be determined the hydrographic conditions were found promising.

A preliminary investigation was made of a supposed recurrence of the "disease" of 1914-15 on a bed in Grand river. Observations were made on the occurrence of certain small yellow spots on the mantle—apparently abnormal and material was preserved for microscopic examination.

In addition to the time devoted to the work outlined above, a great deal of time was spent in the preparation of equipment, in general enquiries into fishing methods, distribution of oysters, enemies of oysters, etc., and in general exploration of the region with a view to further prosecution of the investigation in the future.

APPENDIX No. 7

FISHERIES

FINANCIAL STATEMENT, 1929-30

Vote No.	Service	Appropriation		Expenditure	
		\$	cts.	\$	cts.
	(Salaries and disbursements, F.O.....	\$	543,225 16		
188	Fisheries Patrol Service.....		388,167 66	}	1,159,998 23
	Fisheries Protection Service.....		228,605 41		
189	Building fishways, etc.....	20,000	00		
190	Legal and incidental expenses.....	6,000	00		7,640 93
191	Conservation and development of deep sea fisheries.....	130,000	00		3,350 77
192	Fisheries Intelligence Bureau.....	5,000	00		109,504 49
193	Fish culture.....	442,000	00		2,573 19
194	Oyster culture.....	35,000	00		361,165 09
195	Hair seal bounty.....	50,000	00		29,387 64
196	International Fish Commission (Halibut).....	31,500	00		27,924 00
197	British Columbia Fisheries Reference.....	15,000	00		38,114 88
198 and 419	Marine Biological Board of Canada.....	358,885	00		14,999 99
420	Compensation <i>re Norge</i>	1,000	00		358,885 00
					1,000 00
		2,254,385	00		2,114,544 21
14	Civil Government salaries.....	124,880	00		124,880 00
354	Civil Government salaries.....				775 21
14 and 346	Contingencies.....	33,000	00		32,649 74
Statutory	Fishing bounty.....	160,000	00		159,749 35
		2,572,265	00		2,432,578 51
	<i>Miscellaneous—</i>				
	Gratuities.....				1,160 00
					2,433,738 51

DETAILED STATEMENT OF SALARIES AND DISBURSEMENTS OF FISHERY OFFICERS, EXPENDITURE 1929-30

Provinces	Totals	Supervisors and Inspectors		Allowances			Gasolene and oil	Special Guardians		Sundry
		Salaries	Disbursements	Auto	Boat	Horse		Wages	Expenses	
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>General Account.....</i>	15,848 91									15,848 91
<i>Eastern Fisheries Division—General Account.....</i>	4,142 81	2,400 00	832 69	854 70						55 42
<i>Nova Scotia—</i>										
General Account.....	13,054 83	10,192 58	299 45							2,562 80
Nova Scotia No. 1.....	48,280 25	19,407 57	6,568 35	3,441 40	750 00		175 97	17,393 41	48 88	494 67
" No. 2.....	53,258 86	20,014 35	5,528 01	5,076 37	400 00		121 10	10,396 74	1,056 70	665 59
" No. 3.....	55,036 83	24,459 88	5,968 98	4,914 94				17,259 71	1,637 45	795 87
<i>Prince Edward Island—</i>	159,630 77	74,074 38	18,364 79	13,432 71	1,150 00		297 07	45,049 86	2,743 03	4,518 93
Prince Edward Island No. 1.....	20,775 19	10,443 87	3,900 53	1,967 70				3,314 00	859 00	290 09
" No. 2.....	6,925 49	2,954 03	1,859 45		250 00	66 00	273 11	1,068 00	362 74	92 16
<i>New Brunswick—</i>	27,700 68	13,397 90	5,759 98	1,967 70	250 00	66 00	273 11	4,382 00	1,221 74	382 25
New Brunswick No. 1.....	22,632 17	11,610 00	3,000 13	2,004 00	562 50		201 95	4,877 50	42 62	333 47
" No. 2.....	52,095 98	17,854 03	4,441 68	4,944 80	1,125 54		609 62	20,435 00	1,694 75	990 56
" No. 3.....	27,145 14	10,367 74	886 35	2,669 70	281 25		128 92	13,345 18		66 00
<i>Quebec.....</i>	101,873 29	39,831 77	8,328 16	9,018 50	1,969 29		940 49	38,657 68	1,737 37	1,390 03
<i>Manitoba.....</i>	254 02		254 02							
<i>Saskatchewan.....</i>	31,449 00	10,200 00	4,362 79	1,623 10	750 00	1,093 75	126 92	5,563 75	7,411 71	316 98
<i>Alberta.....</i>	28,024 70	11,430 00	4,506 42	2,670 00	281 25	1,250 00		2,395 50	5,292 19	199 34
<i>British Columbia.....</i>	27,070 57	13,289 69	4,965 12	2,967 20	575 00	950 00	167 14	2,752 50	1,047 75	356 17
British Columbia No. 1.....	47,292 86	9,810 00	3,906 25	5,457 68				14,381 20	11,541 19	2,196 54
" No. 2.....	34,586 06	15,533 58	7,026 24	859 20				7,950 67	1,044 53	2,171 84
" No. 3.....	36,527 96	17,835 21	7,596 90	2,058 60			4 14	5,525 96	1,874 46	2,633 39
General Account.....	28,813 28	19,447 65	2,123 18	830 28						6,412 17
<i>General Account.....</i>	147,220 16	62,626 44	20,651 87	9,205 76			4 14	27,857 83	13,460 18	13,413 94

SUMMARY

Provinces	Totals	Supervisors and Inspectors		Allowances			Gasolene and oil	Special Guardians		Sundry
		Salaries	Disbursements	Auto	Boat	Horse		Wages	Expenses	
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
General Account.....	15,848 91									15,848 91
Eastern Fisheries Division—General Account.....	4,142 81	2,400 00	832 69	854 70						55 42
Nova Scotia.....	159,630 77	74,074 38	18,364 79	13,432 71	1,150 00		297 07	45,049 86	2,743 03	4,518 93
Prince Edward Island.....	27,700 68	13,397 90	5,759 98	1,967 70	250 00	66 00	273 11	4,382 00	1,221 74	382 25
New Brunswick.....	101,873 29	39,831 77	8,328 16	9,018 50	1,969 29		940 49	38,657 68	1,737 37	1,390 03
Quebec.....	254 02		254 02							
Manitoba.....	31,449 00	10,200 00	4,362 79	1,623 10	750 00	1,093 75	126 92	5,563 75	7,411 71	316 98
Saskatchewan.....	28,024 70	11,430 00	4,506 42	2,670 00	281 25	1,250 00		2,395 50	5,292 19	199 34
Alberta.....	27,070 57	13,289 69	4,965 12	2,967 20	575 00	950 00	167 14	2,752 50	1,047 75	356 17
British Columbia.....	147,220 16	62,626 44	20,651 87	9,205 76			4 14	27,857 83	13,460 18	13,413 94
	543,214 91	227,250 18	68,025 84	41,739 67	4,975 54	3,359 75	1,808 87	126,659 12	32,913 97	36,481 97

DETAILED STATEMENT OF FISHERIES PATROL SERVICE—EXPENDITURE, 1929-30—Continued

Establishments and Accounts	Totals	—		Balance	Pay-list	Beard or Provisions	Fuel	Repairs		Supplies			Clothing	Sundry
		\$	cts.	\$	\$	\$	\$	Hull	Engine	Engine	Deck	Stewards		
BRITISH COLUMBIA—Con.														
<i>Departmental Boats—</i>														
<i>District No. 1—</i>														
Elkhorn.....	2,254 80				1,425 00		312 80	\$	\$	\$	\$	\$	\$	\$
Room Crest.....	5,030 79				4,125 00		501 89	cts.	cts.	cts.	cts.	cts.	cts.	cts.
Hummingbird.....	6 27							128 40	326 52	14 00	6 94	17 95	4 54	18 65
Merrysa.....	5,422 83				4,447 58	15 75	138 78	7 53	171 74	30 03	41 74	71 01	34 45	41 98
Swallow.....	5,072 50				4,015 00		49 00	11 07	84 96	279 05	43 35	53 13	7 54	341 64
Swordtail No. 2.....	11,434 38				2,108 89		208 21		46 16	101 00	82 16	104 06	11 22	8,629 86
Vedder River.....	2,136 28				1,385 74		373 95		232 89	143 76	12 38	40 13	17 87	1,19 54
<i>District No. 2—</i>														
Babine No. 1.....	808 85				700 00		98 40		42 85	18 85	2 85	2 60		133 30
Babine No. 2.....	981 39				977 43		98 40	6 80	21 54	18 80	22 90	10 70		124 80
Baldie.....	4,522 39				2,749 35		905 76	99 28	136 40	349 62	57 90	72 84		131 78
Boulton Rock.....	5,223 49				2,454 50		1,174 20	164 33	489 46	332 84	83 05	153 78	9 57	391 10
Cloyan No. 2.....	12,659 94				2,132 41	52 57	576 49	63 02	2 02	215 86	95 41	175 53	10 52	9,326 11
Clappa.....	3,969 63						10 06		3 35	5 21				5,969 63
Hawk Eye.....	3,762 13				1,869 58		787 72	281 50	376 27	135 10	24 27	57 19		170 52
Hem Wing.....	6,105 01				2,504 00	323 34	789 00	439 81	1,641 49	145 00	207 82	106 20		39 25
Marfish.....	3,959 62				4,343 81	1,294 91	420 37	283 41	486 31	507 40	226 34	147 54	65 83	5,397 62
Matra.....	8,023 81													5 10
Rivids.....	3 07				2,444 95		1,277 16	320 98	582 85	353 40	230 90	144 37		97 36
Skeena River.....	5,542 17													
<i>District No. 3—</i>														
Black Raven.....	2,315 57				1,098 55		264 36	21 29	201 07	381 16	44 92	133 77	8 67	101 75
Black Plume.....	3,552 52				1,500 00		1,124 89	260 40	298 26	137 10	104 70	37 06	10 42	109 75
Gull Wing.....	2,350 96				1,500 00		1,576 32	8 00	259 38	205 48	40 72	86 92	8 53	38 65
Parsopa.....	4,010 30				1,678 57	50 40	1,583 86		256 58	297 97	28 90	81 41	25 03	55 89
Vandis.....	10,182 72				6,476 50	1,556 58	351 09	105 84	429 62	752 14	48 85	227 38	83 10	121 62
<i>Chartered Boats—</i>														
<i>District No. 1—</i>														
Betty.....	1,338 75				823 23		46 80			11 86		2 25		454 61
Cadet.....	339 44				301 94									37 50
E. Seely.....	849 16				149 81		202 05			27 80				155 50
Fenn No. 2.....	885 16				497 81									122 00
Penobscot.....	486 87				363 87									801 45
W. T. C.....	2,156 85				1,210 00		70 84			4 86			9 08	
<i>District No. 2</i>														
Ada.....	688 24				319 26		83 04			24 48		3 36		258 00
Alaska.....	1,984 13				712 50		263 80			89 01		3 12		873 00
Amelie.....	2,367 43				889 51		178 80			19 12				1,000 00
Amie C.....	719 25				345 17		60 75			11 69		1 68		294 00
Beatrice H.....	129 17				36 29		24 61			2 70		0 52		24 00
Biddy K.....	46 37						33 53			9 64		3 20		

Brant.....	1,980 05	746 00	269 63	43 22	2 70	918 50
Cowichan No. 2.....	28 00					28 00
Cuprum.....	4,202 36	1,187 74	1,170 05	235 44	3 88	1,605 75
Cutty Sark.....	97 39		34 58	6 00		1,56 81
Doris J.....	1,832 93	809 03	178 70	20 20		825 00
Double A.....	0 75			0 75		773 50
Eleanor Mac.....	1,788 01	667 50	270 02	66 35	1 64	809 00
Elida.....	1,891 85	742 50	278 43	57 12	4 80	809 00
Elsie H.....	1,356 97	109 06	144 40	13 61	7 90	182 00
Eureka.....	2,362 46	909 92	244 35	27 15	5 04	1,176 00
Flying Spur.....	2,699 52	914 52	468 83	97 89	3 28	1,215 00
Full Moon.....	3,506 59	902 67	718 02	229 62	81 28	1,575 00
Gala.....	45 00					45 00
Irene L.....	1,967 80	607 50	465 49	64 81		830 00
Kiki.....	3,600 10	1,344 92	365 96	56 02	3 20	1,830 00
Linnæa.....	1,905 29	716 33	259 97	44 87	3 12	881 00
Lyle H.....	2,579 46	866 69	373 92	85 45	3 40	1,250 00
Oh Boy.....	2,122 08	735 00	318 76	65 80	3 12	1,000 00
Oyashino.....	3,664 82	1,430 97	281 18	46 46	16 21	1,890 00
Pocahontas.....	18 80					318 00
Q. C. Boy.....	794 29	391 95	57 27	23 71	3 36	1,351 00
Reliance.....	2,823 76	1,350 94	80 97	27 49	3 36	792 00
Sea Bee.....	1,828 66	727 50	284 56	20 20	4 40	1,490 00
Seminole.....	2,992 25	1,099 51	349 41	48 33	5 00	1,400 00
Sunbeam No. 2.....	2,101 77	832 50	139 99	4 24	4 24	1,372 00
Tortoise.....	893 07	465 44	43 82	10 01	1 70	934 00
Tuxedo.....	26 38		21 32	5 06		155 00
Venture.....	2,056 09	780 00	267 48	51 91	2 70	85 00
<i>District No. 8—</i>						
Albo.....	739 85	500 00	69 30	12 05	3 50	102 50
Alice.....	311 03	150 00	56 68	15 50	3 85	166 03
Annie B.....	444 34	330 00	8 80	3 54		189 00
Aramac.....	872 04	513 34	160 30	41 40		196 03
Argol.....	254 02	153 33	32 51	2 18		189 00
B.....	544 21	362 26	11 60	4 00		149 50
Betty N.....	733 01	360 00	72 96	13 55	1 66	55 00
Canuck.....	738 01	358 67	42 00	8 27	1 70	182 00
C. H. No. 16.....	259 64	156 67	24 00	3 24	1 10	135 00
Charles No. 2.....	240 73		61 40	7 23		185 00
Cowichan.....	240 67		72 00	5 63		217 00
Crab.....	651 00	436 67	12 00	13 20	1 75	286 00
Crispy.....	292 80	156 67	69 30	21 11	1 60	905 95
Daisy.....	652 86	351 61	134 10	33 44	94 42	155 10
David.....	909 84	463 33	113 78		2 00	70 50
Dorothy N.....	2,155 52	1,100 75	282 73			66 00
Dot.....	2,142 21	1,026 06	99 00			720 40
Dumbo.....	769 60	500 00	7 02	1 60		56 00
Eburne.....	232 45	153 33				176 00
Elma.....	39 68					220 00
Elma.....	294 39	180 00	46 55	11 84		188 40
Emily P.....	2,294 97	1,100 00	419 22	55 35		187 50
Ethel V.....	530 78	284 30	8 40	62 08	1 70	92 00
Ethelwyn.....	813 12	360 00	165 84	35 58		53 50
Fauna.....	331 38	253 34	25 20	5 43	1 64	50 00
Freedom.....	229 97		24 50	3 97		197 50
Gipsy.....	226 90	163 33	9 60	18 90		92 00
Glo.....	715 11	426 67	72 04	5 56	3 90	53 50
Grayling.....	241 57	163 33	22 68			
Harte.....	466 70	293 55	58 80	18 45		
If No. 2.....	220 11	118 49	42 24	5 88		

SUMMARY

Nova Scotia.....	41,663 61	8,048 15	5 55	938 33	636 75	435 04	739 06	228 78	118 16	31 36	30,482 23
Prince Edward Island.....	9,815 37	6,281 23	.....	730 82	27 03	.....	773 14	.....	19 58	.....	2,882 81
New Brunswick.....	27,414 72	12,074 50	.....	2,041 80	67 15	19 96	7,741 12	.....	155 38	30 60	5,241 30
Manitoba.....	24,160 46	11,300 94	2,880 14	7,553 73	119 06	0 48	642 37	554 52	174 72	582 23	531 17
British Columbia.....	285,111 75	104,314 15	3,358 43	24,453 45	3,163 02	6,908 44	6,988 37	1,468 79	2,187 51	377 51	131,892 08
General Account.....	1 75	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 75
	388,167 66	142,018 97	6,244 12	35,718 13	4,013 01	7,363 92	16,284 66	2,290 22	2,656 49	1,032 80	170,845 34

DETAILED STATEMENT OF FISHERIES PROTECTION SERVICE—EXPENDITURE, 1929-30

<i>General Account.....</i>	57 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 10
<i>East Coast—</i>											
Arleux.....	47,596 43	25,444 19	6,247 36	6,786 85	2,379 21	2,230 49	591 35	1,651 04	321 86	1,185 05	759 03
Arras.....	60,226 98	25,771 76	6,342 01	11,521 99	3,377 49	4,604 93	813 33	2,998 18	1,170 87	1,386 73	2,229 69
	107,823 41	51,215 95	12,589 37	18,308 84	5,756 70	6,835 42	1,404 68	4,649 22	1,492 73	2,581 78	2,988 72
<i>West Coast—</i>											
General Account.....	2,294 31	1,163 00	.....	.....	.....	.....	.....	.....	.....	.....	1,131 31
Clvenchy.....	53,177 61	24,233 99	7,680 56	10,109 81	3,372 27	1,476 90	1,157 65	1,809 25	966 59	1,199 58	1,171 01
Malaspina.....	65,252 98	30,330 73	8,538 83	13,907 55	3,886 04	2,681 45	1,000 36	618 04	1,295 97	1,436 26	1,557 75
	120,724 90	55,726 72	16,219 39	24,017 36	7,258 31	4,158 35	2,158 01	2,427 29	2,262 56	2,636 84	3,860 07

SUMMARY

General Account.....	57 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 10
East Coast.....	107,823 41	51,215 95	12,589 37	18,308 84	5,756 70	6,835 42	1,404 68	4,649 22	1,492 73	2,581 78	2,988 72
West Coast.....	120,724 90	55,726 72	16,219 39	24,017 36	7,258 31	4,158 35	2,158 01	2,427 29	2,262 56	2,636 84	3,860 07
	228,605 41	106,942 67	28,808 76	42,326 20	13,015 01	10,993 77	3,562 69	7,076 51	3,755 29	5,218 62	6,905 89

DETAILED STATEMENT OF FISH CULTURE, 1929-30

Hatcheries	Salaries		Maintenance		Total of hatchery		Total of provinces	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
<i>Nova Scotia</i>							63,745	35
Antigonish.....	1,440	00	8,039	46	9,479	46		
Bedford.....	2,745	00	7,393	38	10,138	38		
Lindloff.....			891	68	891	68		
Margaree.....	4,200	00	3,923	93	8,123	93		
Margaree Pond.....	533	93	2,480	99	3,014	92		
Middleton.....	2,745	00	6,137	59	8,882	59		
Yarmouth.....	1,440	00	21,774	39	23,214	39		
<i>Prince Edward Island</i>							8,828	87
Kelly's Pond Hatchery.....	3,060	00	5,768	87	8,828	87		
<i>New Brunswick</i>							70,117	14
Florenceville.....	1,425	00	6,482	11	7,907	11		
Grand Falls.....	1,380	00	5,433	55	6,813	55		
Miramichi.....	3,015	00	6,655	59	9,670	59		
Miramichi Pond.....			4,133	03	4,133	03		
Nepisiquit.....			620	83	620	83		
New Mills Pond.....	861	43	3,717	60	4,579	03		
Restigouche.....	2,876	50	2,953	10	5,829	60		
St. John.....	2,848	55	18,780	16	21,628	71		
St. John Pond.....			8,403	77	8,403	77		
Tobique.....			530	92	530	92		
<i>Manitoba</i>							28,345	72
Dauphin River.....			207	00	207	00		
Dauphin River Spawn Camp.....			1,951	05	1,951	05		
Gull Harbour.....	1,800	00	8,683	46	10,483	46		
Swan Creek.....			2,039	36	2,039	36		
Winnipegosis.....	3,640	00	10,024	85	13,664	85		
<i>Saskatchewan</i>							10,736	09
Cochin Fishing Station.....			1,843	73	1,843	73		
Qu'Appelle.....	3,000	00	5,892	36	8,892	36		
<i>Alberta</i>							39,297	75
Banff.....	3,240	00	7,522	01	10,762	01		
Cold Lake.....			1,833	72	1,833	72		
Jasper Park.....			261	09	261	09		
Lesser Slave.....	3,979	40	12,126	18	16,105	58		
Spray Lakes.....			1,578	69	1,578	69		
Waterton Lakes.....	1,260	00	7,496	66	8,756	66		
<i>British Columbia</i>							117,203	43
General.....	8,271	06	4,944	36	13,215	42		
Anderson.....	2,853	40	5,513	16	8,366	56		
Babine.....	3,054	91	6,159	45	9,214	36		
Cowichan.....	3,724	64	2,431	53	6,156	17		
Cranbrook Eyeing Station.....	419	84	424	55	844	39		
Cultus.....	2,120	39	5,213	98	7,334	37		
Gerrard.....	421	13	1,920	06	2,341	19		
Harrison.....	165	48	2,952	68	3,118	16		
Kennedy.....	3,738	80	4,106	85	7,845	65		
Lloyd's Creek Eyeing Station.....	774	52	1,310	01	2,084	53		
Nelson Eyeing Station.....	2,037	74	5,028	88	7,066	62		
Pemberton.....	4,822	95	4,941	91	9,764	86		
Penask Eyeing Station.....	557	73	3,425	17	3,982	90		
Pitt.....	1,849	59	5,293	96	7,143	55		
Rivers Inlet.....	3,282	62	9,050	04	12,332	66		
Shuswap Lake Camp.....			289	91	289	91		
Skeena.....	3,996	55	6,972	80	10,969	35		
Stuart.....	1,692	74	3,094	52	4,787	26		
Summerland.....	141	77	203	75	345	52		
<i>General Account</i>	6,068	07	16,822	67	22,890	74		

SUMMARY

Hatcheries	Salaries	Maintenance	Total of hatchery	Total of provinces
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	13,103 93	50,641 42	63,745 35	
Prince Edward Island.....	3,060 00	5,768 87	8,828 87	
New Brunswick.....	12,406 48	57,710 66	70,117 14	
Manitoba.....	5,440 00	22,905 72	28,345 72	
Saskatchewan.....	3,000 00	7,736 09	10,736 09	
Alberta.....	8,479 40	30,818 35	39,297 75	
British Columbia.....	44,125 86	73,077 57	117,203 43	
General Account.....	6,068 07	16,822 67	22,890 74	
	95,683 74	265,481 35	.....	361,165 09

DETAILED STATEMENT OF CONSERVATION AND DEVELOPMENT OF DEEP SEA
FISHERIES EXPENDITURE, 1929-30

General account.....	\$	2,101 05	
Co-operative Association.....		3,152 58	
Destruction of sea lions and hair seals.....		498 72	
Fishermen's picnic (Exhibition at Lunenburg, N.S.).....		2,037 21	
International Pacific salmon investigation.....		76 27	
Salmon trap investigation.....		966 90	
Scallop investigation—General.....	\$	45 77	
Boat <i>Alberton</i>		3,374 82	
Boat <i>Madeline A.</i>		6,917 96	
			10,338 55
Technical education of fishermen.....			7,121 18
Transportation of fish—General.....	\$	563 98	
Cape Breton service.....		39,194 85	
Ecum-Secum-Halifax service.....		8,918 28	
Halifax-L'Ardoise service.....		1,500 00	
Marie Joseph-Canso service.....		20,031 61	
Port Latour-Lockport service.....		1,548 39	
Sonora-Halifax service.....		533 33	
Westport-Digby service.....		10,921 59	
			83,212 03
			\$ 109,504 49

DETAILED STATEMENT OF MARINE BIOLOGICAL BOARD EXPENDITURE, 1929-30

"A"—General Account.....		\$ 2,495 53	
St. Andrews Biological Station.....	48,277 07		
Fish handling building.....	5,248 93		
Marine food fishes investigation.....	3,095 05		
Oceanographic investigation.....	1,319 80		
		57,940 85	
Nanaimo Biological Station.....	45,869 70		
Herring and pilchard investigation.....	2,065 12		
Herring and pilchard investigation (joint).....	2,053 80		
Oyster investigation.....	25 18		
Pink and chum salmon investigation.....	4,836 58		
Salmon tagging.....	10,396 00		
Sea lion investigation.....	16 60		
Shell fish investigation.....	22 94		
Shrimp investigation.....	176 66		
Trout investigation.....	0 45		
		65,463 14	
			125,995 52
"B"—General Account.....		\$ 8,190 45	
Atlantic Experimental Station.....	34,313 30		
Demonstration building.....	5,652 41		
Eastern passage laboratory.....	6,953 52		
Fish-curing apparatus.....	2,164 28		
Fish curing investigation.....	5,442 58		
Fishermen's course.....	61 87		
Haddock investigation.....	406 87		
Ice fillets.....	8,229 80		
Overseers course.....	1,174 28		
Permanent building.....	3,131 81		
Short courses.....	2,680 38		
		70,211 10	
Pacific Experimental Station.....	\$ 26,433 61		
Investigations general.....	105 22		
Biological building No. 2.....	7,080 50		
Discoloration investigation.....	914 68		
Glues investigation.....	224 14		
Meals investigation.....	688 80		
Oils investigation.....	412 76		
Refrigeration investigation.....	24 00		
Salmon investigation.....	72 65		
Salmon spoilage.....	22 44		
Salmon tagging.....	21 82		
		36,000 62	
		\$ 114,402 17	
Advances outstanding.....		120 18	
			\$ 114,522 35
"C"—General Account.....		\$ 53 84	
Atlantic salmon investigation.....	1,326 20		
Brook trout investigation.....	2,487 45		
Eagle river investigation.....	4,303 78		
Experimental demonstration in hatching.....	3,423 65		
Experimental demonstration in fry planting.....	33 50		
Experimental demonstration in rearing.....	1,025 61		
General lakes survey.....	2,895 37		
Oyster investigation.....	4,192 38		
Pacific Salmon Research Station—Cultus lake.....	12,692 29		
Pacific trout investigations.....	946 17		
Pathological investigation.....	138 85		
Prairie lakes investigation.....	7,484 17		
Trout investigation.....	14 82		
Whitefish investigation.....	593 69		
			41,611 77
Advances outstanding.....			511 07
			42,122 84
Grand Total Expenditure.....			\$ 282,544 71

MISCELLANEOUS REVENUE MARINE BIOLOGICAL BOARD, 1929-30

"A"—St. Andrews Station—			
Sundries.....		\$ 43 50	
"B"—Atlantic Experimental Station—			
Ice fillets.....	\$ 6,486 89		
Sundries.....	1,312 45		
		7,799 34	
			\$ 7,842 84

APPENDIX No. 8

STATEMENT OF EXPENDITURE AND REVENUE, BY PROVINCES,
IN FISHERIES SERVICES, 1867 TO 1929-30 UNDER DOMINION
GOVERNMENT

SUMMARY

	Expenditure	Revenue
	\$ cts.	\$ cts.
Nova Scotia.....	4,858,679 54	340,282 57
Prince Edward Island.....	788,820 39	102,332 77
New Brunswick.....	3,602,755 27	565,776 02
Quebec.....	2,425,987 14	341,293 80
Ontario.....	3,214,671 13	520,135 96
Manitoba and North-West Territories.....	23,414 29	4,779 25
Manitoba.....	1,732,054 18	323,582 48
North-West Territories.....	58,258 58	9,775 23
Alberta.....	475,931 38	201,857 30
Saskatchewan.....	553,350 19	100,049 79
British Columbia.....	11,388,283 74	2,653,321 09
Yukon.....	29,343 94	11,112 75
Hudson Bay District.....		821 83
CRUISERS	29,151,549 77	5,175,120 84
Nova Scotia, Prince Edward Island and New Brunswick.....	5,041,120 11	
Expenditures, general.....	34,192,669 88	
	3,712,838 87	
Fishing bounty.....	37,905,508 75	
	7,590,064 76	
Total expenditure 1867-1929-30.....	45,495,573 51	

FISHING BOUNTIES

Year	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Totals
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1882.....	106,098 72	16,997 00	16,137 00	33,052 75	172,285 47
1883.....	89,432 50	12,395 20	8,577 14	19,940 01	130,344 85
1884.....	104,934 09	13,576 00	9,230 96	28,004 93	155,718 98
1885.....	103,999 73	15,908 25	10,166 65	31,464 76	161,539 39
1886.....	98,789 54	17,894 57	10,935 87	33,283 61	160,903 59
1887.....	99,662 03	19,699 65	12,528 51	31,907 73	163,757 92
1888.....	89,778 90	18,454 92	9,092 96	32,858 75	150,185 53
1889.....	90,142 51	21,026 79	13,994 53	33,362 71	158,526 54
1890.....	91,235 64	21,108 33	11,686 32	34,210 72	158,241 01
1891.....	92,377 42	17,235 96	12,771 30	34,507 17	156,891 85
1892.....	109,410 39	10,864 61	9,782 79	29,694 35	159,752 14
1893.....	108,060 67	12,524 09	9,328 62	28,320 72	158,234 10
1894.....	111,460 03	12,690 80	7,875 79	28,040 18	160,066 80
1895.....	110,765 27	12,919 32	9,285 13	30,598 27	163,567 99
1896.....	98,048 95	13,602 88	9,745 50	32,992 44	154,389 77
1897.....	102,083 50	13,454 50	9,809 00	32,157 00	157,504 00
1898.....	103,730 00	13,746 00	10,188 00	31,795 00	159,459 00
1899.....	106,598 50	13,514 50	7,822 00	32,065 00	160,000 00
1900.....	101,448 00	13,562 50	10,589 00	33,203 00	158,802 50
1901.....	101,024 50	13,420 50	8,335 50	33,161 50	155,942 00
1902.....	100,455 70	14,555 80	8,716 55	36,125 45	159,853 50
1903.....	99,714 15	14,872 75	9,652 50	34,703 30	158,943 70
1904.....	99,286 44	15,110 80	9,179 35	33,651 65	157,228 24
1905.....	100,664 35	15,379 50	8,317 20	34,185 60	153,546 65
1906.....	99,518 80	16,247 55	8,839 40	34,410 00	159,015 75
1907.....	93,381 70	16,454 50	10,175 95	36,101 35	156,113 50
1908.....	98,156 20	17,203 75	9,708 90	34,931 05	159,999 90
1909.....	95,413 60	15,480 15	8,973 85	35,354 25	155,221 85

FISHING BOUNTIES—*Concluded*

Year	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Totals
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1910.....	96,468 20	16,531 05	9,557 80	36,609 70	159,166 75
1911.....	99,424 90	15,795 00	8,669 85	36,109 95	159,999 70
1912.....	97,904 25	15,109 75	11,119 00	35,863 40	159,996 40
1913.....	93,456 00	16,385 05	11,081 85	37,738 35	158,661 25
1914.....	94,990 54	17,536 50	10,339 65	36,717 45	158,584 14
1915.....	90,611 05	17,609 95	9,513 95	41,006 10	158,741 05
1916.....	88,212 10	17,540 15	9,961 95	44,285 60	159,999 80
1917-18.....	86,115 60	17,538 35	10,754 75	45,484 40	159,893 10
1918-19.....	85,000 65	17,114 35	10,392 35	47,167 90	159,675 25
1919-20.....	85,521 05	16,085 20	8,702 20	44,828 25	155,136 70
1920-21.....	93,873 00	13,773 70	8,110 70	36,761 90	152,519 30
1921-22.....	91,410 20	14,640 60	9,413 00	43,986 00	159,449 80
1922-23.....	93,254 45	16,311 25	7,704 40	39,902 45	157,172 55
1923-24.....	91,261 55	16,123 25	10,153 65	42,378 35	159,916 80
1924-25.....	86,300 20	15,634 05	11,410 15	46,482 00	159,826 40
1925-26.....	82,550 35	18,824 30	10,670 70	47,939 45	159,984 80
1926-27.....	83,006 90	16,721 00	13,221 55	46,818 65	159,768 10
1927-28.....	82,107 00	19,906 80	12,095 45	44,266 55	158,375 80
1928-29.....	79,077 60	19,387 80	9,334 30	43,611 50	151,411 20
1929-30.....	83,458 85	20,310 90	10,744 90	45,234 70	159,749 35
	4,589,636 27	768,780 17	484,371 42	1,747,276 90	7,590,064 76

STATEMENT SHOWING THE ANNUAL EXPENDITURE ON ACCOUNT OF MARINE POLICE SERVICE ON THE ATLANTIC COASTS OF CANADA FOR PATROLLING THE TERRITORIAL FISHERIES 1870-1874 INCLUSIVE

1870.....	\$	
1871.....	73,550 86	
1872.....	50,123 24	
1873.....	53,794 90	
1874.....	15,364 69	
		192,833 69

During the period 1875 to 1885, inclusive, the Washington Treaty, which gave United States fishermen the use of Canadian Inshore fisheries, was in force.

On the expiry of the Fishery Articles of the Treaty of Washington, the present Fisheries Protection Service was organized in 1886. The following is a statement of the annual expenditure on such account from 1886 to 1929-30 inclusive.

FISHERIES PROTECTION SERVICE

In addition to Cruisers, entered under Ontario, Quebec and British Columbia:—

1886.....	\$ 104,020 98	1897.....	\$ 71,349 44
1887.....	86,300 74	1898.....	78,097 10
1888.....	59,869 47	1899.....	68,330 27
1889.....	47,748 94	1900.....	66,148 97
1890.....	51,296 34	1901.....	96,648 26
1891.....	81,918 99	1902.....	75,942 24
1892.....	84,305 51	1903.....	75,543 60
1893.....	60,269 69	1904.....	103,427 32
1894.....	70,501 71	1905.....	294,440 34
1895.....	61,310 19	1906.....	136,432 61
1896.....	64,064 00	1907.....	99,015 07

(No proper division of the expenditure of these roving Cruisers could be made between the Maritime Provinces, although *pro rata* shares are fairly chargeable to N.S., N.B., and P.E.I.)

1908-09.....	\$ 114,923 00	1918-19.....	\$ 56,256 78
1909-10.....	113,582 23	1919-20.....	218,143 93
1910-11.....	116,235 21	1920-21.....	227,159 57
1911-12.....	120,240 00	1921-22.....	172,003 39
1912-13.....	163,370 19	1922-23.....	107,658 85
1913-14.....	225,113 26	1923-24.....	95,332 27
1914-15.....	95,702 02	1924-25.....	95,714 47
1915-16.....	102,637 16	1925-26.....	98,060 10
1916-17.....	132,393 60	1926-27.....	113,804 14
1917-18.....	118,824 16	1927-28.....	125,015 62
		1928-29.....	125,920 64
		1929-30.....	173,213 75

\$ 5,041,120 11

A *pro-rata* share of this amount is chargeable to the Provinces of N.S., N.B., and P.E.I.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION.

PROVINCE OF NOVA SCOTIA

Year	General Service		Cruisers	Fish Breeding		Total		Revenue	
	\$	cts.		\$	cts.	\$	cts.	\$	cts.
1867.....									
1868.....	225	28				225	28	*	12,275 25
1869.....	2,572	23				2,572	23		848 46
1870.....	9,728	26				9,728	26	*	1,873 24
1871.....	8,794	37				8,794	37		36 74
1872.....	8,341	39				8,341	39		51 45
1873.....	8,689	07				8,689	07		159 30
1874.....	10,585	13				10,585	13		123 94
1875.....	12,265	86				12,265	86		551 00
1876.....	14,655	76		6,870	33	21,526	09		403 00
1877.....	15,127	49		3,488	27	18,615	76		1,520 71
1878.....	15,292	83		3,400	00	18,692	83		1,442 38
1879.....	14,312	76		2,687	44	17,000	20		1,796 11
1880.....	14,180	55		3,323	16	17,503	71		1,506 72
1881.....	14,909	42		3,454	29	18,363	71		2,779 49
1882.....	16,479	41		5,858	98	22,338	39		1,111 61
1883.....	16,247	14		4,191	34	20,438	48		2,005 29
1884.....	15,600	01		4,728	11	20,428	12		1,833 18
1885.....	17,503	45		4,610	81	22,114	26		2,616 28
1886.....	17,852	33		7,478	23	25,330	56		2,166 53
1887.....	18,092	21		6,701	89	24,794	00		1,585 28
1888.....	18,308	02		6,850	27	25,158	29		3,905 44
1889.....	20,201	09		6,688	75	26,889	84		2,744 23
1890.....	17,395	24		6,606	95	24,002	19		5,424 95
1891.....	17,844	19		5,863	75	23,707	94		5,891 65
1892.....	18,755	86		10,289	80	29,045	66		3,803 42
1893.....	19,444	22		5,045	22	24,489	44		6,782 02
1894.....	20,420	81		4,982	12	25,402	93		5,296 27
1895.....	23,555	38		5,054	24	28,609	62		7,075 07
1896.....	23,049	41		5,010	39	28,059	80		6,180 93
1897.....	23,682	33		4,077	07	27,759	40		5,239 55
1898.....	21,683	91		3,525	03	25,208	94		5,317 08
1899.....	25,348	11		2,465	19	27,813	30		4,668 22
1900.....	27,461	91		3,410	84	30,872	75		5,494 49
1901.....	35,730	69		11,194	82	46,925	51		6,595 94
1902.....	32,618	00		8,810	31	41,428	31		6,084 65
1903.....	39,118	79		7,413	55	46,532	34		3,962 45
1904.....	30,003	01		6,348	22	36,351	23		3,716 75
1905.....	32,619	85		11,372	65	43,992	50		6,718 58
1906.....	49,351	10		33,203	27	82,554	37		4,934 43
1907.....	24,989	09		6,259	25	31,248	34		3,118 73
1908-09.....	87,420	00		20,969	27	108,389	27		5,369 70
1909-10.....	81,698	70		15,722	27	97,420	97		3,821 81
1910-11.....	117,394	67		28,023	29	145,417	96		7,749 60
1911-12.....	141,148	00		42,727	00	183,875	00		5,912 65
1912-13.....	97,085	47		46,411	56	143,497	04		6,730 00
1913-14.....	125,305	94		45,732	88	171,038	82		7,682 50
1914-15.....	124,977	45		37,470	70	162,448	15		7,415 80
1915-16.....	117,271	06		34,914	01	152,185	07		6,969 18
1916-17.....	126,416	67		33,543	89	159,960	56		7,176 70
1917-18.....	139,964	62		36,057	56	176,022	18		6,663 94
1918-19.....	112,689	57		17,233	22	129,922	79		7,612 81
1919-20.....	92,197	95		16,243	01	109,160	96		10,213 28
1920-21.....	111,196	47		22,077	83	133,274	30		12,189 62
1921-22.....	112,521	25		21,247	10	133,768	35		12,840 39
1922-23.....	121,336	89		27,399	27	148,736	16		12,720 42
1923-24.....	138,671	11		42,395	03	181,066	14		9,480 38
1924-25.....	153,463	48		32,467	75	185,931	23		10,627 54
1925-26.....	170,967	83		31,053	08	202,020	91		9,539 68
1926-27.....	171,975	48		29,869	84	201,845	32		10,973 25
1927-28.....	237,097	63		28,148	93	265,246	56		11,758 25
1928-29.....	253,106	30		111,139	02	364,245	32		12,816 88
1929-30.....	253,160	63		63,745	35	318,905	98		14,877 48
	3,862,823	14		995,856	40	4,858,679	54		340,282 57

See Cruiser Sheet N.S., P.E.I., and N.B.

*Revenue from licences to U.S. Fishing Vessels to which the Province has no exclusive title.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION—Continued

PROVINCE OF PRINCE EDWARD ISLAND

Year	General Service		Cruisers		Fish Breeding		Total		Revenue	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1867										
1868										
1869										
1870										
1871										
1872										
1873										
1874		405 62						405 62		
1875		459 54						459 54		
1876		461 02						461 02		
1877		1,974 70						1,974 70		
1878		1,836 54						1,836 54		
1879		1,293 25						1,293 25		
1880		2,686 49			4,494 24			7,180 83		40 00
1881		2,691 49			852 11			3,543 60		40 00
1882		2,756 48			760 32			3,516 80		40 00
1883		2,716 64			807 32			3,523 96		80 00
1884		2,767 98			771 40			3,539 38		80 00
1885		3,028 03			741 06			3,769 09		40 00
1886		3,187 73			687 17			3,874 90		40 00
1887		4,044 49			1,200 21			5,244 70		128 00
1888		3,402 51			755 32			4,157 83		
1889		3,746 69			140 31			3,887 00		140 00
1890		3,113 21						3,113 21		302 88
1891		3,242 25			378 00			3,620 25		667 00
1892		1,835 65						1,835 65		166 00
1893		2,847 60						2,847 60		304 10
1894		3,078 55						3,078 55		980 15
1895		3,796 58						3,796 58		3,312 30
1896		3,555 87						3,555 87		2,161 85
1897		3,744 36						3,744 36		2,032 25
1898		6,775 78						6,775 78		2,707 57
1899		5,832 35						5,832 35		2,242 24
1900		7,364 20						7,364 20		2,207 12
1901		7,934 03						7,934 03		1,525 30
1902		7,814 02						7,814 02		1,843 45
1903		7,081 60						7,081 60		2,007 35
1904		7,320 96			10,733 51			18,054 47		1,983 42
1905		6,879 05			6,813 77			13,692 82		2,046 50
1906		9,351 81			6,419 04			15,770 85		2,206 25
1907		5,841 67			2,952 47			8,794 14		1,300 94
1908-09		14,996 00			7,187 47			22,183 47		2,393 66
1909-10		13,657 56			8,139 50			21,797 06		2,359 93
1910-11		38,570 72			8,874 42			47,445 14		2,499 63
1911-12		13,661 00			8,876 00			22,537 00		2,477 50
1912-13		13,558 06			6,105 63			19,663 69		2,927 96
1913-14		13,728 89			7,383 45			21,112 34		2,245 60
1914-15		17,369 93			8,071 93			25,441 86		2,046 50
1915-16		14,794 05			9,638 61			24,432 66		3,165 35
1916-17		15,843 23			7,211 18			23,054 41		3,597 18
1917-18		19,076 19			7,994 24			27,070 43		3,256 26
1918-19		15,722 08			3,003 84			18,725 92		2,561 19
1919-20		17,430 98			2,918 40			20,349 38		4,741 68
1920-21		22,911 72			4,312 69			27,224 41		3,720 12
1921-22		15,430 17			4,304 58			19,734 75		2,876 47
1922-23		17,996 16			4,801 56			22,797 72		5,854 88
1923-24		22,111 52			4,859 03			26,970 55		4,441 95
1925-25		26,051 31			5,147 60			31,198 91		3,134 90
1925-26		26,719 74			6,609 94			33,329 68		3,467 88
1926-27		20,302 73			4,533 27			24,836 00		3,403 13
1927-28		19,176 79			5,085 20			24,261 99		3,766 28
1928-29		39,129 65			4,799 60			43,929 25		3,451 25
1929-30		58,519 81			8,828 87			67,348 68		3,318 80
		611,627 03			177,193 36			788,820 39		102,332 77

See Cruiser Sheet N.S., P.E.I., and N.B.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION—*Continued*

PROVINCE OF NEW BRUNSWICK

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867					
1868	5,086 77			5,086 77	443 47
1869	4,172 35			4,172 35	*5,410 58
1870	8,422 63			8,422 63	1,086 42
1871	7,006 52			7,006 52	1,042 03
1872	6,476 61			6,476 61	1,058 29
1873	6,859 05		822 33	7,681 38	647 61
1874	7,351 17		3,100 13	10,451 30	978 00
1875	7,373 75		3,853 73	11,227 48	830 00
1876	10,080 37		3,247 41	13,327 78	2,030 91
1877	11,168 53		1,388 80	12,557 33	1,289 17
1878	10,926 11		1,468 22	12,394 33	2,015 46
1879	10,858 64		1,139 00	11,997 64	3,467 36
1880	12,291 00		5,600 00	17,891 00	4,276 07
1881	11,776 56		3,455 91	15,232 47	4,695 28
1882	12,284 82		3,567 28	15,852 10	4,848 84
1883	13,007 00		2,646 14	15,653 14	4,612 12
1884	14,388 02		2,327 06	16,715 08	3,905 66
1885	14,892 87		2,943 98	17,836 85	4,650 16
1886	15,719 36		2,852 02	18,571 38	4,078 10
1887	16,944 00		2,907 16	19,851 16	4,417 52
1888	20,533 20		3,441 59	23,974 79	7,625 64
1889	20,298 00		3,150 17	23,448 17	8,642 88
1890	14,914 95		3,727 77	18,642 72	8,834 35
1891	16,082 77		4,572 41	20,655 18	7,233 69
1892	15,707 98		4,304 98	20,012 96	6,634 83
1893	15,721 05		4,988 13	20,709 18	7,831 53
1894	18,522 94		4,833 27	23,356 21	8,333 24
1895	21,370 94		5,896 95	27,267 89	11,170 36
1896	20,526 56		6,551 62	27,078 18	10,696 88
1897	21,671 92		3,722 01	25,393 93	10,110 77
1898	17,063 58		3,958 63	21,022 21	11,511 85
1899	22,922 50		7,514 86	30,437 36	10,430 08
1900	21,459 94		3,951 58	25,411 52	12,015 27
1901	28,452 51		5,976 29	34,428 80	10,150 40
1902	23,813 62		12,245 86	36,059 48	11,658 34
1903	27,132 84		16,099 01	43,231 85	11,188 02
1904	27,664 34		22,177 05	49,841 39	10,643 20
1905	25,253 16		15,477 39	40,730 55	11,893 99
1906	35,856 38		25,759 09	61,615 47	11,395 84
1907	24,938 35		16,900 00	41,838 35	9,158 08
1908-09	71,091 00		22,214 39	93,305 39	12,385 14
1909-10	63,154 19		21,102 75	84,256 94	13,044 88
1910-11	63,769 48		20,414 56	84,184 04	12,996 84
1911-12	58,140 00		22,950 00	81,090 00	13,902 15
1912-13	60,943 53		30,267 38	91,210 91	15,192 52
1913-14	63,653 64		51,641 12	115,294 76	17,507 18
1914-15	67,954 09		52,560 08	120,514 17	14,263 99
1915-16	65,874 11		40,876 42	106,750 53	15,097 80
1916-17	67,645 91		37,987 56	105,633 47	15,137 19
1917-18	70,148 87		37,021 69	107,170 56	14,429 53
1918-19	67,763 94		36,351 19	104,115 13	16,420 52
1919-20	73,821 07		34,275 01	108,096 08	16,441 02
1920-21	86,431 23		41,493 38	127,924 61	15,299 82
1921-22	102,713 10		44,971 62	147,684 72	16,212 85
1922-23	96,836 88		50,298 75	147,135 63	19,286 01
1923-24	71,052 58		40,870 11	111,922 69	13,010 14
1924-25	97,200 01		46,096 12	143,296 13	11,701 49
1925-26	106,052 99		50,910 64	156,963 63	9,754 13
1926-27	99,696 49		48,245 23	147,941 72	10,740 76
1927-28	113,738 34		102,131 24	215,869 58	12,663 50
1928-29	99,822 31		62,034 34	161,856 65	14,337 67
1929-30	106,859 30		70,117 14	176,976 44	13,003 90
	2,421,356 72		1,881,398 55	3,602,755 27	565,776 02

See Cruiser Sheet N.S., P.E.I., and N.B.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION—Continued.

PROVINCE OF QUEBEC

Year	General Service		Cruisers		Fish Breeding		Total		Revenue	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1867	10,272	82	14,426	53			24,699	35	6,998	90
1868	17,889	92	11,374	95			29,264	87	4,910	87
1869	6,909	61	10,800	00			17,709	61	4,585	80
1870	6,570	42	9,924	51			16,494	93	*7,997	21
1871	7,000	00	9,000	00			16,000	00	6,290	85
1872	6,489	68	12,000	00			18,489	68	4,569	69
1873	7,829	94	9,000	00			16,829	94	4,983	83
1874	9,265	31	10,000	00	6,106	00	25,371	31	8,523	54
1875	9,808	34	10,000	00	8,515	46	28,323	80	8,904	85
1876	14,282	65	23,832	82	9,016	74	47,132	21	6,437	00
1877	13,521	44	17,059	21	5,670	86	36,251	51	5,881	72
1878	12,723	88	19,967	11	6,685	85	39,376	84	5,453	27
1879	13,606	06	8,994	48	5,772	90	28,373	44	6,286	07
1880	12,591	78	1,880	08	4,701	34	19,173	20	7,124	42
1881	15,123	79	50,550	18	5,444	89	71,118	86	9,286	18
1882	14,819	22	26,965	40	9,148	68	50,933	30	7,165	32
1883	13,287	30	26,555	46	7,987	12	47,829	88	3,869	47
1884	13,186	26	19,935	53	8,512	11	41,633	90	2,715	02
1885	13,531	77	*31,514	07	10,072	52	55,118	36	3,325	35
1886	13,938	21	26,091	20	9,197	89	49,227	30	2,963	75
1887	14,966	55	18,293	16	8,740	66	42,000	37	3,804	66
1888	13,463	37	17,233	51	8,921	13	39,618	01	5,394	99
1889	12,991	63	16,034	04	10,228	72	39,254	39	3,390	79
1890	9,670	94	15,001	91	8,370	15	33,043	00	5,409	81
1891	10,666	98	15,143	46	9,142	31	34,952	75	3,642	14
1892	10,917	36	14,026	98	8,341	94	33,286	28	5,244	82
1893	11,761	34	14,688	97	9,337	79	35,788	10	7,471	70
1894	11,692	82	25,645	29	8,635	41	45,973	52	7,211	82
1895	12,459	34	19,523	86	8,854	64	40,837	84	8,836	18
1896	11,870	43	20,661	78	8,260	50	40,792	71	8,160	98
1897	12,910	80	12,059	54	7,059	45	32,029	79	7,876	12
1898	11,140	16	13,781	53	6,128	40	31,050	09	7,571	15
1899	11,350	27	21,680	55	5,700	58	38,731	40	6,287	71
1900	5,452	41	18,970	42	12,701	04	37,123	87	2,543	04
1901	7,934	03	16,258	44	15,218	64	39,411	11	4,738	92
1902	6,242	58	24,995	46	20,142	94	51,380	98	2,498	85
1903	6,585	86	21,021	00	8,080	03	35,686	89	4,379	15
1904	7,619	67	23,011	05	11,454	24	42,084	96	5,070	64
1905	6,769	16	15,976	88	14,140	65	36,886	69	4,648	56
1906	8,123	04	26,969	49	12,617	01	47,709	54	7,564	39
1907	5,590	94	22,763	29	10,683	24	39,037	47	8,145	97
1908-09	11,960	00	36,402	00	16,760	46	65,122	46	6,797	91
1909-10	10,316	05	25,811	96	19,292	31	55,420	32	4,947	46
1910-11	8,984	36	42,975	48	20,290	50	72,250	34	5,336	61
1911-12	17,050	00	32,998	00	18,104	00	68,152	00	6,044	75
1912-13	10,998	48	25,321	81	17,152	03	53,472	32	8,095	79
1913-14	9,921	88	29,770	88	23,042	82	62,735	58	5,286	89
1914-15	11,503	00	30,644	81	22,000	08	64,147	89	7,638	75
1915-16	6,995	74	31,893	30	17,323	62	56,212	66	6,006	89
1916-17	7,168	09	26,356	47	14,274	14	47,798	70	6,981	14
1917-18	8,899	76	42,752	33	19,727	25	70,879	34	7,664	73
1918-19	7,470	58	41,563	30	12,923	27	61,957	15	8,121	80
1919-20	9,793	46	33,679	99	13,125	26	56,598	71	8,085	78
1920-21	33,182	26	45,963	09	15,955	38	95,100	73	6,536	90
1921-22	23,815	41	49,947	22	18,772	19	92,534	82	14,357	39
1922-23	2,146	60	904	32	2,668	48	5,719	40		
1923-24	282	90	143	81			426	71		
1924-25	178	47					178	47		
1925-26	596	57					596	57		
1926-27	123	12					123	12		
1927-28	144	84					144	84		
1928-29	128	94					128	94	192	70
1929-30	254	02					254	02	31	81
	624,242	61	1,240,740	91	561,003	62	2,425,987	14	341,293	80

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY, THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION.

PROVINCE OF ONTARIO

Year	General Service	Cruisers	Fish Breeding	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867.....	6,108 00			6,108 00	3,492 00
1868.....	6,526 96			6,526 96	1,927 02
1869.....	8,547 65			8,547 65	2,739 13
1870.....	5,995 72		2,874 47	8,870 19	6,165 56
1871.....	5,825 98		4,446 34	10,272 32	5,039 35
1872.....	4,364 43		5,529 73	9,894 16	4,818 57
1873.....	4,344 32		3,697 16	8,041 48	4,547 50
1874.....	8,969 06		5,100 00	14,069 06	4,386 75
1875.....	8,388 81		5,635 74	14,024 55	4,478 05
1876.....	12,815 73		12,920 90	25,736 63	4,640 21
1877.....	13,521 44		12,132 70	25,654 14	4,673 25
1878.....	12,723 88		4,949 77	17,673 65	5,202 00
1879.....	11,741 40		7,102 54	18,843 94	6,188 80
1880.....	12,003 37		5,300 71	17,304 08	6,465 95
1881.....	11,506 74		5,422 63	16,929 37	7,795 99
1882.....	11,729 77		8,655 82	20,385 59	9,849 18
1883.....	13,602 00		7,761 45	21,363 45	9,980 28
1884.....	15,192 73		8,011 17	23,203 90	11,345 14
1885.....	17,135 98		8,690 15	25,826 13	11,914 37
1886.....	17,900 74		9,696 54	27,597 28	15,917 62
1887.....	19,534 01		8,880 14	28,414 15	15,063 57
1888.....	19,860 52		9,529 00	29,389 52	18,251 25
1889.....	19,264 98	2,631 46	11,311 33	33,207 77	24,266 06
1890.....	14,539 87	2,254 63	11,494 31	28,288 81	23,666 95
1891.....	15,540 30	2,769 29	11,769 81	30,079 40	26,611 70
1892.....	15,155 83	5,064 91	9,281 37	29,502 11	26,708 00
1893.....	20,116 91	32,940 56	11,194 65	64,252 12	30,623 09
1894.....	22,634 37	20,022 18	10,821 43	53,477 98	28,632 82
1895.....	21,938 56	19,373 24	8,755 93	50,067 73	33,211 60
1896.....	24,917 48	17,295 94	9,468 37	51,681 79	35,681 68
1897.....	21,592 40	15,948 43	8,774 19	46,315 02	32,814 66
1898.....	19,239 34	15,155 43	9,976 74	44,371 51	30,574 57
1899.....	11,784 22	15,122 45	9,982 10	36,888 97	5,830 85
1900.....	3,604 94	12,250 72	10,675 72	26,531 38	794 12
1901.....	3,819 57	11,304 51	12,835 60	27,959 68	717 35
1902.....	4,445 93	11,764 87	12,445 31	28,656 11	373 42
1903.....	4,660 53	12,334 37	14,844 36	31,839 26	1,818 83
1904.....	4,500 43	45,133 10	15,300 46	64,933 99	2,578 48
1905.....	4,294 60	109,560 51	13,832 32	127,687 43	1,471 91
1906.....	4,949 67	32,585 51	15,069 17	52,604 35	499 15
1907.....	3,188 34	32,698 85	14,112 42	49,999 61	349 10
1908-09.....	14,898 00	36,038 00	28,358 02	79,294 02	790 78
1909-10.....	9,672 24	26,009 14	22,614 30	58,295 68	1,520 75
1910-11.....	11,788 30	24,237 49	24,393 21	60,419 00	280 25
1911-12.....	28,127 00	28,006 00	47,611 00	103,744 00	658 45
1912-13.....	13,213 90	30,015 23	61,580 26	104,809 41	548 74
1913-14.....	22,733 57	27,650 61	68,877 81	119,261 99	806 69
1914-15.....	23,048 82	30,169 08	103,182 20	156,400 10	918 80
1915-16.....	19,468 64	28,216 58	63,712 73	111,397 95	2,600 65
1916-17.....	14,588 69	25,994 06	85,922 62	126,505 37	808 70
1917-18.....	15,838 94	36,708 63	69,864 18	122,411 75	2,345 48
1918-19.....	4,586 56	53,404 30	64,996 55	122,987 41	631 85
1919-20.....	247 00	39,575 17	75,479 78	115,301 95	1,421 80
1920-21.....	5 09	84,373 39	82,320 21	166,698 69	9,221 25
1921-22.....		52,260 83	80,403 37	132,664 20	44,425 97
1922-23.....		27,901 41	79,690 16	107,591 57	4,169 29
1923-24.....		355 62	84,180 87	84,536 49	6,076 71
1924-25.....			79,471 88	79,471 88	957 73
1925-26.....			79,938 10	79,938 10	9,719 28
1926-27.....			19,894 97	19,894 97	126 91
1927-28.....			25 38	25 38	
1928-29.....					
1929-30.....					
	666,744 26	967,126 52	1,580,800 35	3,214,671 13	520,135 96

*MANITOBA AND NORTHWEST TERRITORIES

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1867-68					
1868-69					
1869-70					
1870-71					
1871-72					
1872-73					
1873-74					
1874-75	288 65			288 65	
1875-76					
1876-77	250 00			250 00	
1877-78	200 00			200 00	
1878-79	200 00			200 00	
1879-80	19 75			19 75	
1880-81					
1881-82	809 55			809 55	
1882-83	150 00			150 00	
1883-84	872 40			872 40	
1884-85	763 00			763 00	
1885-86	1,920 73			1,920 73	
1886-87	2,468 25			2,468 25	5 00
1887-88	2,816 64			2,816 64	819 25
1888-89	2,848 16			2,848 16	848 00
1889-90	2,604 70			2,604 70	794 00
1890-91	3,609 03			3,609 03	1,234 00
1891-92	3,593 32			3,593 43	1,079 00
	23,414 29			23,114 29	4,779 25

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1892.

PROVINCE OF MANITOBA

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1892-93	2,162 55		6,943 35	9,105 90	1,464 68
1893-94	2,187 35		7,362 53	9,549 88	715 85
1894-95	2,063 55		3,849 98	6,513 53	2,149 30
1895-96	3,952 18		2,865 69	6,817 87	1,670 19
1896-97	1,908 14		24 79	1,932 93	1,719 00
1897-98	1,206 26		1,586 12	2,792 38	1,515 00
1898-99	1,883 37		3,967 36	5,850 73	1,537 85
1899-00	1,723 59		2,791 71	4,515 30	2,028 00
1900-01	2,669 74		4,174 53	6,844 27	1,103 00
1901-02	2,624 87		2,622 43	5,247 30	2,279 00
1902-03	3,129 70		2,415 09	5,544 79	1,784 00
1903-04	2,789 74		3,978 04	6,767 78	4,002 70
1904-05	2,800 64		7,041 67	9,842 31	4,879 70
1905-06	3,687 07	7,867 70	25,923 29	37,477 06	4,148 00
1906-07	2,173 33	55 00	15,858 35	18,086 68	2,285 98
1907-08	4,638 51	13,903 95	25,283 46	43,825 92	3,527 05
1908-09	3,946 00	7,560 00	16,987 13	28,493 13	3,704 22
1909-10	9,359 23	7,794 02	14,386 86	31,540 11	3,962 88
1910-11	9,432 70	7,309 55	15,161 39	31,894 64	8,137 75
1911-12	7,371 00	6,571 00	15,793 00	29,735 00	6,334 00
1912-13	7,062 15	12,298 62	40,801 11	60,161 88	6,039 00
1913-14	29,694 13	48,006 49	47,769 97	125,470 59	4,846 50
1914-15	28,887 50	172,677 12	31,532 95	233,097 57	8,312 08
1915-16	13,518 89	61,986 35	26,654 36	102,159 60	5,926 00
1916-17	13,228 17	19,122 24	25,750 64	58,101 05	8,252 27
1917-18	13,164 99	18,943 45	28,277 84	60,386 28	12,910 65
1918-19	11,647 78	22,058 23	29,405 83	63,111 84	12,730 20
1919-20	8,704 69	21,176 75	26,379 94	56,261 38	12,139 17
1920-21	10,979 14	16,787 94	38,893 96	66,661 04	17,792 58
1921-22	14,458 95	23,624 52	33,850 69	71,934 16	11,636 54
1922-23	17,570 39	21,852 05	30,787 33	70,298 77	12,736 68
1923-24	14,630 97	20,051 25	28,429 89	63,112 11	15,683 38
1924-25	14,197 83	21,519 12	25,646 64	61,363 59	17,631 21
1925-26	17,172 70	22,251 26	21,265 04	60,689 00	17,908 00
1926-27	16,769 07	21,775 71	19,924 81	58,379 59	21,291 05
1927-28	21,379 96	15,623 11	22,954 22	59,957 29	23,781 18
1928-29	21,512 09	22,680 03	30,335 78	74,527 90	24,867 23
1929-30	31,584 85	24,160 46	28,345 72	84,091 03	30,150 67
	378,374 77	637,655 92	716,023 49	1,732,054 18	323,582 48

* Subsequent to 1892, see Manitoba and Northwest Territories separate sheets.

MARINE AND FISHERIES

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1906.

PROVINCE OF SASKATCHEWAN

Year	General Services	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1906-07.....	2,677 77			2,677 77	509 00
1907-08.....	7,277 49			7,277 49	948 60
1908-09.....	6,591 00			6,591 00	1,085 50
1909-10.....	6,474 57			6,474 57	1,209 44
1910-11.....	10,470 46			10,470 46	1,246 00
1911-12.....	* 26,040 00			* 26,040 00	1,304 75
1912-13.....	* 17,850 00			* 17,850 00	4,268 50
1913-14.....	* 24,964 74		* 13,969 84	* 38,934 58	8,253 05
1914-15.....	* 34,130 50		20,642 23	54,772 73	4,329 65
1915-16.....	* 31,294 44		4,714 72	36,009 16	3,195 00
1916-17.....	16,002 77		4,897 97	20,900 74	3,103 25
1917-18.....	16,959 11		5,732 96	22,692 07	3,643 65
1918-19.....	16,966 00		5,529 72	22,495 72	4,982 83
1919-20.....	19,019 11		4,147 16	23,166 27	4,321 00
1920-21.....	12,700 20		7,180 29	19,880 49	4,077 30
1921-22.....	15,330 53		6,157 00	21,487 53	3,474 31
1922-23.....	14,212 56		7,887 32	22,099 88	2,904 65
1923-24.....	14,281 88		6,981 38	21,263 26	3,589 50
1924-25.....	16,469 50		8,505 56	24,975 06	6,706 39
1925-26.....	18,156 07		6,873 95	25,030 02	6,066 35
1926-27.....	18,590 43		6,878 44	25,468 87	6,057 68
1927-28.....	19,593 93		7,792 50	27,386 43	6,274 24
1928-29.....	21,892 19		8,753 11	30,645 30	9,178 99
1929-30.....	28,024 70		10,736 09	38,760 79	9,320 19
	415,969 95		137,380 24	553,350 19	100,049 79

*Includes Alberta.

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1906.

PROVINCE OF ALBERTA

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1906-07.....	3,681 45			3,681 45	2 50
1907-08.....	5,440 66			5,440 66	2 50
1908-09.....	5,714 00			5,714 00	915 00
1909-10.....	8,063 22			8,063 22	703 00
1910-11.....	10,739 86			10,739 86	698 50
1911-12.....	*			*	709 00
1912-13.....	*			*	
1913-14.....	*			*	
1914-15.....	*		5,608 42	5,608 42	6,102 50
1915-16.....	*		4,798 69	4,798 69	5,237 85
1916-17.....	15,086 14		4,543 09	19,629 23	5,970 40
1917-18.....	13,262 62		4,127 81	17,390 43	9,767 94
1918-19.....	50,267 84		4,920 96	20,188 80	10,288 15
1919-20.....	15,633 19		7,203 06	22,836 25	8,313 85
1920-21.....	12,700 20		8,617 04	21,317 24	8,693 75
1921-22.....	12,473 92		9,956 33	22,430 25	10,119 30
1922-23.....	13,690 46		6,552 84	20,243 30	11,947 80
1923-24.....	13,880 42		6,419 16	20,299 58	10,111 50
1924-25.....	16,431 37		5,280 07	21,711 44	12,708 13
1925-26.....	18,744 72		8,255 38	27,000 10	14,932 99
1926-27.....	21,391 73		8,345 03	29,736 76	20,233 41
1927-28.....	22,435 76		7,792 50	30,228 26	20,666 41
1928-29.....	23,768 45		58,736 67	92,505 12	19,219 37
1929-30.....	27,070 57		39,297 75	66,368 32	24,513 45
	275,476 58		200,454 80	475,931 38	201,857 30

*Included in Saskatchewan.

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE
SINCE CONFEDERATION.

PROVINCE OF BRITISH COLUMBIA

Year	General Service		Cruisers		Fish Culture		Total		Revenue	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.	\$	cts.
1867										
1868										
1869										
1870										
1871										
1872										
1873										
1874										
1875										
1876										
1877		635 00						635 00		
1878		690 00						690 00		
1879		1,423 73						1,423 73		
1880		1,399 92						1,399 92		10 00
1881		1,721 48						1,721 48		
1882		1,599 08						1,599 08		672 50
1883		1,599 92						1,599 92		790 00
1884		2,231 97			3,704 31		5,936 28		127 50	
1885		1,437 13			11,873 17		13,310 30		365 50	
1886		1,878 53			5,405 87		7,284 40		922 50	
1887		5,860 72			4,623 35		10,484 07		943 50	
1888		3,661 83			5,653 90		9,315 73		6,934 55	
1889		4,333 63			4,933 26		9,266 89		6,416 00	
1890		3,634 41			4,202 61		7,837 02		11,367 50	
1891		4,320 53			3,339 51		7,660 04		12,914 02	
1892		6,158 17			2,896 57		9,054 74		8,192 48	
1893		5,490 60			3,630 68		9,121 28		40,264 00	
1894		5,283 21			3,273 10		8,556 31		25,337 90	
1895		6,218 74			2,869 19		9,087 93		23,517 25	
1896		6,226 77			2,817 02		9,043 79		26,410 75	
1897		8,841 64			2,840 62		11,682 26		39,888 82	
1898		8,508 79			2,389 46		10,898 25		47,864 75	
1899		8,459 47			3,736 14		12,195 61		45,801 75	
1900		13,662 17			2,741 88		16,404 05		53,195 35	
1901		17,886 36			17,709 77		35,596 13		52,960 35	
1902		18,660 73	40,122 50		20,508 57		79,291 80		41,178 65	
1903		17,808 45	36,239 02		23,275 29		77,322 76		43,015 62	
1904		15,133 65	33,083 19		25,040 81		73,257 65		56,904 34	
1905		16,631 37	42,104 39		61,675 57		120,411 33		47,436 00	
1906		30,141 35	54,113 76		83,687 16		167,942 25		51,532 50	
1907		20,381 97	34,228 34		39,379 94		93,990 25		29,903 95	
1908-09		55,951 00	86,151 00		64,149 57		206,251 57		39,251 65	
1909-10		44,799 61	306,185 98		66,847 35		417,832 94		41,864 80	
1910-11		99,794 13	80,532 84		97,848 04		278,175 01		45,846 70	
1911-12		43,265 00	133,558 00		75,907 00		252,730 00		44,898 51	
1912-13		110,779 22	221,061 83		68,719 37		400,560 42		48,824 50	
1913-14		129,393 33	501,715 55		83,123 10		714,231 98		52,835 50	
1914-15		227,807 84	153,082 83		77,340 42		458,231 09		41,423 95	
1915-16		112,827 34	138,594 96		66,071 97		317,494 27		46,862 54	
1916-17		106,861 03	109,234 29		55,615 62		271,710 94		47,327 84	
1917-18		123,295 97	117,621 80		54,359 16		295,276 93		53,515 21	
1918-19		138,876 49	104,048 17		59,048 99		301,973 65		59,349 94	
1919-20		176,973 35	243,141 41		111,918 01		532,032 77		270,698 41	
1920-21		188,597 86	393,096 67		130,421 69		712,116 22		233,282 04	
1921-22		137,662 63	382,272 93		134,628 71		654,564 27		153,904 33	
1922-23		137,343 43	304,771 79		113,437 53		555,552 75		223,657 57	
1923-24		131,580 83	297,600 19		121,182 83		550,363 85		122,435 24	
1924-25		128,897 11	273,227 13		124,025 49		526,149 73		86,218 79	
1925-26		167,560 18	255,491 62		126,095 12		549,146 92		117,755 80	
1926-27		211,667 84	276,838 74		108,987 77		597,494 35		116,072 66	
1927-28		218,889 30	331,157 07		112,532 65		662,579 02		53,377 01	
1928-29		161,380 06	329,488 09		123,217 69		614,085 84		44,546 67	
1929-30		172,668 89	405,836 65		117,203 43		695,708 97		34,503 40	
		3,268,793 74	5,684,600 74		2,434,889 26		11,388,283 74		2,653,321 09	

MARINE AND FISHERIES

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1900.

YUKON

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1900-01	1,159 81			1,159 81	406 00
1901-02	2,066 66			2,066 66	1,130 00
1902-03	1,522 00			1,522 00	320 00
1903-04	1,400 00			1,400 00	240 00
1904-05	1,400 00			1,400 00	340 00
1905-06	1,083 31			1,083 31	282 00
1906-07	1,030 35			1,030 35	173 00
1907-08	1,226 30			1,226 30	274 00
1908-09	1,019 00			1,019 00	228 00
1909-10	2,416 63			2,416 63	457 00
1910-11	1,984 95			1,984 95	907 50
1911-12	2,095 00			2,095 00	203 25
1912-13	1,909 83			1,909 83	342 00
1913-14	1,520 00			1,520 00	226 00
1914-15	2,158 80			2,158 80	304 00
1915-16	1,794 75			1,794 75	315 00
1916-17	1,482 65			1,482 65	275 00
1917-18	1,530 75			1,530 75	375 00
1918-19	531 50			531 50	425 00
1919-20	11 65			11 65	215 00
1920-21					280 00
1921-22					375 00
1922-23					320 00
1923-24					330 00
1924-25					340 00
1925-26					355 00
1926-27					350 00
1927-28					505 00
1928-29					415 00
1929-30					405 00
	29,343 94			29,343 94	11,112 75

STATEMENT SHOWING THE ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE 1892.

NORTHWEST TERRITORIES

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1892-93	1,770 41			1,770 41	197 00
1893-94	3,143 94			3,143 94	211 14
1894-95	3,515 16			3,515 16	309 50
1895-96	2,963 02			2,963 02	586 50
1896-97	2,181 58			2,181 58	344 13
1897-98	2,324 66			2,324 66	393 87
1898-99	4,065 68			4,065 68	150 50
1899-00	3,848 25			3,848 25	1,522 50
1900-01	6,251 39			6,251 39	816 55
1901-02	5,928 22			5,928 22	950 07
1902-03	7,076 26			7,076 26	1,350 50
1903-04	7,317 49			7,317 49	922 50
1904-05	7,003 55			7,003 55	1,151 50
1905-06	11,124 22			11,124 22	868 97
	58,258 58			58,258 58	9,775 23

NOTE.—For Alberta and Saskatchewan subsequent to 1906, see separate statements for each.

STATEMENT SHOWING ANNUAL EXPENDITURE OF, AND REVENUE COLLECTED
BY THE DOMINION GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE.

HUDSON BAY DISTRICT

Year	General Service	Cruisers	Fish Culture	Total	Revenue
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1903-04.....					10 00
1904-05.....					10 00
1905-06.....					10 00
1906-07.....					10 00
1907-08.....					360 00
1908-09.....					20 00
1909-10.....					301 83
1910-11.....					100 00
					821 83

APPENDIX No. 9

LIST OF UNITED STATES FISHING VESSELS WHICH ENTERED
CANADIAN PORTS ON THE ATLANTIC COAST DURING
THE YEAR ENDED DECEMBER 31, 1929

Name of vessel	Number times entered	Tonnage	Number of crew	Reason for entry	Quantity of fish landed— if any lbs.
Acushla.....	10	70	23	Shelter.....	
Albatross.....	4	56	20	".....	
Albert D. Willard.....	5	36	8	".....	
Alice and Mildred.....	1	34	9	".....	
Alice and Wilson.....	7	16	8	".....	
Azores.....	1	53	19	Land sick seaman.....	
Adventurer.....	2	62	27	Shelter.....	
Aeolus.....	11	16	8	".....	
Angie C. Marshall.....	3	56	23	".....	
Alden.....	1	44	14	".....	
American.....	1	63	23	".....	
America.....	11	44	8	".....	
Arancia.....	3	92	23	".....	
Bettina.....	3	66	8	".....	
Belline.....	1	93	10	".....	
Barbara.....	6	9	8	".....	
Benjamin Thompson.....	3	18	8	".....	
Cormorant.....	1	179	17	".....	
Constellation.....	8	89	21	".....	
Cape Ann.....	3	80	19	".....	
Col. Lindbergh.....	5	28	11	".....	
Corinthian.....	1	97	10	".....	
Catherine Burke.....	2	68	13	".....	
Chester T. Marshall.....	5	16	3	".....	
Col. Lindbergh.....	7	41	9	".....	
Dana.....	4	42	17	".....	
Dawn.....	4	70	27	".....	
Doris F. Amero.....	1	51	10	".....	
Desire.....	4	21	8	".....	
Dorothy M.....	4	11	6	".....	
Daisy Z.....	1	10	3	".....	
Elk.....	8	66	23	".....	
Ellen T. Marshall.....	7	75	25	".....	
Elsie.....	2	66	23	".....	
Eleanor Nickerson.....	3	113	27	".....	
Elizabeth M. King.....	10	13	8	".....	
Edith M. Cooney.....	2	26	7	".....	
Elk.....	1	66	23	".....	
Edith H. Cooney.....	4	12	6	".....	
Echel B. Penny.....	1	54	20	".....	
Elizabeth W. Nunan.....	3	48	20	".....	
Flora L. Oliver.....	5	59	23	".....	
Funchal.....	9	20	8	".....	
Gertrude DeCosta.....	12	70	25	".....	
Gossoon.....	2	51	27	".....	
Grand Marshall.....	7	70	23	".....	
Gov. Foss.....	5	107	23	".....	
Georgianna.....	1	87	5	".....	
Helen M.....	1	51	9	Collecting fish.....	
Herbert Parker.....	2	93	10	Shelter.....	
Hesperus.....	4	92	25	".....	
Imperator.....	2	79	23	".....	
Ingomar.....	3	85	21	Land sick seaman, shelter.....	
Isabelle Parker.....	1	48	27	Shelter.....	
Irene and Mabel.....	6	18	10	".....	
Isabelle.....	1	11	7	".....	
Joffre.....	1	80	21	Land sick seaman.....	
John J. Fallow.....	9	60	23	Shelter.....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the
Atlantic Coast During the Year Ended December 31, 1929—*Concluded*

Name of vessel	Number times entered	Tonnage	Number of crew	Reason for entry	Quantity of fish landed— if any
John A. Cooney.....	7	14	8	Shelter.....	lbs.
Joseph Warner.....	2	11	7	".....	
Juneau.....	1	57	8	".....	
J. M. Marshall.....	1	60	22	".....	
Josephine DeCosta.....	2	60	22	".....	
Killarney.....	8	73	21	" , purchase supplies.....	
L. A. Dunton.....	5	112	25	" , repairs.....	
Lark.....	1	121	27	".....	
Laura Goulart.....	22	73	21	" , land sick seaman.....	
Leonora C.....	1	73	9	".....	
Louise B. Marshall.....	6	74	27	" , water.....	
Lincoln.....	1	42	12	".....	
Little Ruth.....	4	24	10	".....	
Mary DeCosta.....	3	62	23	".....	
Mary E. O'Hara.....	7	49	25	".....	
Mary Sears.....	1	65	27	" , repairs.....	
Mercedes.....	1	11	5	" , water.....	
Morning Star.....	5	57	23	".....	
Mary P. Goulart.....	1	66	27	".....	
Mildred Robinson.....	1	73	8	".....	
Marie and Winnifred.....	8	43	9	".....	
Mary Curtis.....	1	67	7	" , water.....	
Maris Stella.....	1	97	12	".....	
Mary Sabina.....	1	99	5	Collect fish.....	
Natalie Hammond.....	9	51	23	Shelter.....	
Newcastle.....	1	19	8	".....	
Oretha F. Spinney.....	1	65	25	" , repairs.....	
Old Glory.....	1	51	14	".....	
Pilgrim.....	5	52	21	".....	
Progress.....	2	61	20	" , water.....	
Richard Nunan.....	1	55	16	".....	
Rhodora.....	3	70	22	".....	
Rita Viator.....	1	22	9	".....	10,000
Shawmet.....	2	101	17	".....	
Squanto.....	15	81	21	".....	
Sadie M. Nunan.....	1	38	15	".....	
Sunapee.....	9	18	9	".....	
Stilletto.....	1	136	14	".....	10,000
Satelite.....	3	14	3	Collecting lobsters.....	
Thomaston.....	10	19	7	Shelter.....	
Thelma.....	1	28	12	".....	
Teazer.....	2	59	22	".....	
Viola.....	15	10	7	".....	
Wanderer.....	3	164	27	".....	
Zelpha.....	6	13	7	".....	

APPENDIX No. 10

LIST OF UNITED STATES FISHING VESSELS WHICH ENTERED
CANADIAN PORTS ON THE PACIFIC COAST DURING
THE YEAR ENDED DECEMBER 31, 1929

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
America.....	10	25	11	Bait and ice	cwt.
Alitak.....	8	14	4	“ sell fish.....	60
Argo.....	9	26	6	“ land sick man.....	1,120
Arne.....	11	23	6	Sell fish, bait and ice.....	1,140
Aleutian.....	14	36	13	“ bait.....	2,900
Akutan.....	9	46	9	“	1,280
Augusta.....	9	19	5	“	2,060
Atlantic.....	10	24	9	“ bait and ice.....	1,600
Alten.....	7	43	10	“ bait and ice.....	640
Albatross.....	6	40	13	“ bait and ice.....	1,760
Anna J.....	13	22	6	“ bait and ice.....	980
Attu.....	5	37	10	“ bait and ice.....	1,940
Addington.....	9	26	6	“	120
Alki.....	3	7	3	“	1,880
Arrow.....	7	40	9	“	2,180
Atlas.....	10	31	7	“	450
Arctic.....	3	29	7	“	
Alice B.....	3	13	5	Bait and ice.....	
Aloha.....	14	19	5	“	
Arcade.....	19	14	4	“	
Angelus.....	4	28	6	“	
Antler.....	4	28	5	“	
Alma.....	2	27	5	“	
Arcturus.....	1	8	2	“	
Alitar.....	1	14	4	“	
Brunvoll II.....	2	27	6	“	
Blanco.....	12	24	6	“	
Betty Jane.....	9	34	6	“ land sick man.....	600
Bolinda.....	10	22	6	Sell fish, bait and ice.....	1,200
Betty.....	9	15	5	“	2,680
Brisk.....	8	37	9	“	1,860
Bonanza.....	9	30	6	“	700
Baltic.....	5	20	5	“	140
Bluebird.....	4	5	2	“	680
Brothers.....	6	13	5	“	340
Bravo.....	4	14	3	“	
Beaver.....	3	17	5	“	
Brownie.....	1	6	1	Bait.....	
Corona.....	5	19	11	Bait and ice, sell fish.....	80
Chancellor.....	8	14	5	“	160
California.....	10	24	5	“	
Columbia.....	8	41	9	“ sell fish.....	1,960
Coolidge.....	8	32	8	“	1,660
Cedric.....	12	19	6	Sell fish.....	1,260
Celtic.....	9	39	10	“	2,780
Chelsea.....	8	51	10	“ bait and ice.....	1,120
Carolyn.....	4	18	5	“	140
Chum.....	5	6	3	“	360
Cora.....	8	4	2	“	300
Charlotte.....	3	4	2	“	140
Constitution.....	4	39	8	“	1,020
Clipper.....	4	54	10	“	2,020
Condor.....	3	11	3	“	300
Commonwealth.....	2	60	10	“	560
Curlew.....	12	18	5	Bait and ice.....	
Clarion.....	1	15	5	“	
Diana.....	10	22	6	“	100
Discovery.....	12	10	4	Bait and ice; sell fish; engine trouble; orders.....	
Daily.....	8	26	7	Bait and ice, sell fish.....	940
Defense.....	4	20	5	Sell fish.....	600
Don Q.....	5	9	3	“	440
Democrat.....	7	27	7	“	1,360
Dorothy.....	5	89	15	“	520
Dalko.....	4	4	2	“	200
Doric.....	3	42	10	“	880

LIST of United States Fishing Vessels Which Entered Canadian Ports on the Pacific Coast During the Year Ended December 31, 1929—*Continued*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
					cwt.
Diana.....	5	22	6	Sell fish.....	120
Daguy.....	1	4	3	".....	60
Dora H.....	3	15	5	Bait and ice.....	
Dawn.....	3	12	4	".....	
Eclipse.....	14	44	11	" sell fish.....	1,400
Eidsvold.....	4	15	5	".....	
Eureka.....	19	11	4	" sell fish.....	1,080
Evolution.....	12	17	5	" supplies; engine trouble..	
Estep.....	12	26	6	Bait and ice, sell fish.....	1,280
Explorer.....	3	34	9	Sell fish.....	760
Eagle.....	10	67	9	".....	3,200
Excel.....	8	27	6	".....	1,340
Eldorado.....	10	47	10	".....	3,640
Excel II.....	3	41	9	".....	940
Electra.....	7	48	10	" bait and ice.....	1,020
Eastern Point.....	6	4	3	".....	540
Eleanora.....	6	16	5	Bait and ice.....	
Essential.....	3	16	4	".....	
Flamingo.....	3	13	5	".....	
Foremost.....	13	66	10	In transit, sell fish.....	400
Fairway.....	9	19	5	Bait and ice, sell fish; purchase hooks.....	780
Flattery.....	2	10	3	Sell fish.....	120
Frisco.....	11	10	3	".....	680
Franklin.....	5	34	9	".....	1,140
Federal.....	8	28	6	" bait and ice.....	900
Faith.....	15	7	3	Bait and ice.....	91
Flint.....	4	24	6	".....	
Forward.....	11	18	5	".....	
Fortuna.....	2	21	5	".....	
Glacier.....	8	13	7	Sell fish.....	880
Grayling.....	6	16	5	".....	800
Grant.....	8	43	9	".....	2,420
Garland.....	5	10	3	".....	340
Gloria.....	6	17	5	" bait.....	360
Gloria II.....	6	16	4	" bait and ice.....	80
Gony.....	5	12	5	" bait and ice.....	140
Gjoa.....	3	3	3	".....	300
Gretchen.....	8	8	3	Bait and ice.....	34
Harding.....	16	19	6	Sell fish, bait and ice.....	80
Helgeland.....	8	56	10	".....	2,580
Havana.....	10	41	10	".....	2,700
Hazel H.....	9	24	5	".....	1,180
Hi Gill.....	5	12	4	".....	450
Happy.....	7	12	4	".....	700
Hilda.....	2	10	3	".....	140
Hoover.....	8	27	6	" bait and ice.....	80
Hamings.....	1	13	5	Bait.....	
Halcyon.....	1	22	6	Fuel.....	
Irene.....	9	30	9	Sell fish, bait and ice.....	1,560
Ilene.....	8	33	7	".....	2,100
Ivanhoe.....	7	27	6	".....	900
Ionic.....	18	24	6	"..... (land sick man)	100
Ithona.....	9	20	6	".....	1,280
Inger.....	1	7	3	".....	60
J. P. Todd II.....	6	12	5	".....	720
Jack.....	12	4	3	".....	400
Joan W.....	1	21	5	Bait and ice.....	
Kodiak.....	10	38	13	Sell fish, bait and ice.....	280
Kennebec.....	1	4	3	".....	100
Kanaga.....	8	47	10	" bait and ice.....	1,840
Kanatak.....	3	39	9	".....	820
Katalla.....	1	16	5	Bait.....	
Lebanon.....	10	15	5	Sell fish, bait and ice.....	40
Liahona.....	6	40	8	".....	1,620
Lancing.....	6	16	5	".....	640
Lumnen.....	4	10	3	".....	420
Lituya.....	9	30	7	".....	1,620
Lenor.....	4	14	4	".....	450
Leviathan.....	3	29	8	".....	340
Lindy.....	8	49	10	" bait and ice.....	2,320
Liberty.....	5	44	10	".....	1,740

LIST of United States Fishing Vessels Which Entered Canadian Ports on the
Pacific Coast During the Year Ended December 31, 1929—*Continued*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed cwt.
La Paloma.....	6	14	11	Bait and ice.....	
Louise.....	10	16	5	".....	
Mayflower.....	5	7	3	Sell fish.....	200
Marmot.....	4	30	9	".....	1,320
Majestic.....	8	33	9	".....	2,500
Mitkof.....	13	46	10	".....	3,940
McKinley.....	11	38	10	".....	4,060
Mars.....	4	9	4	".....	580
Middleton.....	12	24	6	".....	2,240
Mary.....	11	16	8	Bait and ice.....	
Merit.....	19	11	4	".....	90
Mermaid.....	15	19	5	".....	
Mariner.....	2	21	5	".....	
Madeline J.....	9	25	5	".....	
Mildred.....	2	19	5	".....	
Myrtle.....	2	9	3	".....	
M. 1777.....	1	4	1	Shelter.....	
Mary T.M. 1749.....	1	5	1	Repairs.....	
Norma Jane.....	2	4	3	Sell fish.....	60
Neptune.....	12	43	13	Bait and ice, engine trouble.....	
Norrone.....	12	21	6	Sell fish.....	1,760
Northern.....	7	38	9	".....	2,060
Nordie.....	8	30	9	".....	1,680
Nordby.....	9	40	8	".....	2,800
Norland.....	5	19	6	".....	880
North.....	9	35	9	".....	2,380
National.....	8	20	6	".....	600
New England.....	1	70	21	Repairs.....	
North.....	24	9	3	Supplies, sell fish.....	19
Nomad.....	1	15	4	Bait and ice.....	
Norma.....	1	6	2	".....	
Norma G.....	1	13	4	".....	
Naomi.....	7	3	2	Sell fish.....	8
Orient.....	11	48	13	Sell fish, bait and ice.....	20
Omaney.....	6	34	10	".....	1,540
Onah.....	13	18	5	".....	1,380
Oakleaf.....	1	5	2	".....	80
Orbit.....	9	24	6	" engine trouble.....	25
Oceanus.....	13	26	6	Bait and ice.....	
Ocean.....	1	4	1	Shelter.....	
Prosperity.....	13	25	6	Sell fish, bait and ice (engine trouble)	220
Pacific.....	7	44	10	".....	1,420
Panama.....	5	35	10	".....	1,460
Pioneer.....	10	48	10	" bait and ice.....	2,100
President.....	17	24	6	".....	200
Portlock.....	7	36	9	".....	2,500
Polaris.....	5	45	10	".....	1,500
Pierce.....	18	14	4	" bait and ice.....	1,200
Paragon.....	8	69	10	".....	1,380
Pegge.....	4	4	3	".....	380
Pioneer III.....	3	26	5	Bait and ice.....	
Pershing.....	2	18	5	Sell fish.....	12
Preslio.....	11	14	5	Bait and ice.....	
Primrose II.....	2	6	2	Bait.....	
Ranier.....	8	39	10	Sell fish.....	2,280
Royal.....	5	15	5	".....	100
Reliance.....	6	8	3	".....	440
Rosemarie.....	2	15	6	".....	80
Roald Amundsen.....	2	22	6	".....	140
Radio.....	4	63	10	".....	960
Reliance I.....	9	19	5	".....	1,460
Resolute.....	8	47	9	".....	2,600
Reform.....	3	6	3	".....	300
Rival.....	1	4	3	".....	80
Reliance.....	7	14	4	" bait and ice.....	780
Ranier.....	7	4	2	".....	300
Rambler.....	1	10	3	".....	60
Republic.....	9	51	13	" bait and ice.....	40
Repeat.....	5	14	3	Bait and ice.....	
Restitution.....	16	24	5	".....	
Rosario.....	4	16	5	".....	
Roosevelt.....	2	13	5	".....	
Report.....	1	14	4	".....	

LIST of United States Fishing Vessels Which Entered Canadian Ports on the Pacific Coast During the Year Ended December 31, 1929—*Concluded*

Name of Vessel	Number of times entered	Tonnage	Number of men in crew	Reason for Entry	Quantity of fish landed
					cwt.
Summit.....	3	21	6	Sell fish, bait and ice.....	260
Sea Bird.....	6	28	6	"	1,120
Sumner.....	3	34	8	" bait and ice.....	180
Sherman.....	13	18	5	"	1,940
Sund 'E.....	7	36	9	" bait and ice.....	1,800
Sunset.....	2	7	4	"	220
Seymour.....	6	44	10	" bait and ice.....	720
Seattle.....	5	55	10	"	1,340
Senator.....	8	11	7	"	2,660
Sitka.....	5	50	10	"	1,840
Sentinel.....	9	21	6	"	3,180
Sunset.....	12	37	9	"	540
Star.....	5	12	3	"	100
Suomi.....	2	8	3	"	1,860
Superior.....	13	26	6	" bait and ice.....	450
Sirius.....	5	17	4	"	100
S. & S.....	1	5	3	"	1,400
Spray.....	8	20	6	" bait and ice.....	
Sylvia.....	10	30	6	Bait and ice.....	
Selma J.....	11	9	4	Bait and ice.....	
Sadie R.....	5	16	5	"	
Tahoma.....	10	18	6	Sell fish.....	1,780
Tatoosh.....	11	23	6	"	2,280
Thor (1).....	10	25	13	"	3,000
Thor.....	4	4	2	"	100
Tordenskjold.....	8	39	13	" bait and ice.....	140
Teddy J.....	7	13	5	"	980
Tyee.....	6	13	4	"	600
Tagalak.....	4	48	10	" bait and ice.....	420
Trinity.....	7	41	10	"	2,060
Thelma M.....	2	7	3	"	160
Thora.....	2	5	3	"	100
Thelma II.....	11	26	6	" bait and ice.....	160
Texas.....	5	16	5	Bait and ice.....	
Tillikum.....	1	21	4	"	
Unimak.....	19	10	5	Sell fish, bait and ice.....	520
Urania.....	3	27	6	Sell fish.....	520
Uranus.....	5	20	5	Bait and ice.....	
Unatilla.....	1	8	2	Bait.....	
Visitor.....	4	4	3	Sell fish.....	140
Venus.....	8	25	7	"	1,720
Venus.....	2	4	3	"	140
Viola.....	17	4	3	"	980
Venture.....	9	36	9	"	2,240
Virginia.....	3	33	5	"	340
Viking.....	5	11	4	" bait and ice.....	468
Vansee.....	8	58	9	"	1,860
Ventura.....	1	5	2	"	60
Velero.....	5	6	4	Bait and ice.....	
Vivian.....	3	9	3	"	
Volunteer.....	6	20	6	"	
Velva.....	1	6	2	"	
Valor.....	1	26	8	"	
Wabash.....	16	6	3	Sell fish.....	680
Woodrow.....	13	23	5	" bait and ice.....	120
Wizard.....	7	49	10	"	2,100
Western.....	11	41	9	"	3,180
Wave.....	13	7	3	"	760
Wilson.....	1	19	5	"	80
Washington.....	2	29	7	"	180
Wireless.....	12	19	6	" bait and ice.....	20
Wenterstad.....	7	9	3	" supplies, bait and ice.....	80
Westford.....	2	17	5	Bait and ice.....	
Whitestar.....	16	17	5	"	
Wesley.....	8	9	4	"	
Wilhelmine.....	1	17	5	"	
West Wind.....	1	5	1	Fuel.....	
Yakutat.....	7	41	9	Sell fish.....	2,080
Yellowstone.....	4	22	6	"	420
Yukon.....	8	31	6	"	1,580
Yaquina.....	10	29	6	Bait and ice.....	
Zenith.....	9	47	9	Sell fish.....	2,560

APPENDIX No. 11

LICENCES ISSUED

The following is a statement of the different kinds of licences issued by the different supervisors, during the 1929-30 season:—

MAGDALEN ISLANDS, QUEBEC—SUPERVISOR S. T. GALLANT

Kind of Licences	Number of Licences Issued
Lobster fishing licences.....	659
Lobster packing licences.....	14
Lobster packing extensions—17	
Fish cannery licences.....	1
Reduction works licences.....	1
Certificates under section 66—4	
Herring seine licences.....	20
Herring trap-net licences.....	25 (7 cod trap-nets)
Smelt bag-net licences.....	42 (2 box-nets)
Smelt gill-net licences.....	223 (1 spoiled)
	985 (7 cod trap-nets, 2 box-nets, 1 spoiled)

PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

Lobster fishing licences.....	1,640 (3 cancelled)
Lobster packing licences.....	88
Lobster packing extensions—66	
Oyster fishery licences.....	243
Quahaug fishery licences.....	18
Fish cannery licences.....	19
Reduction works licences.....	Nil
Certificates under section 66—4	
Trap-net fishing licences.....	3
Scallop fishery licences.....	Nil
Lobster pound licences.....	1
Smelt bag-net licences.....	263
Smelt gill-net licences.....	349
Oyster lease—1	
	2,624 (3 cancelled)

NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Lobster fishing licences.....	1,901
Lobster packing licences.....	41
Lobster packing extensions—35	
Oyster fishery licences.....	118
Fish cannery licences.....	4
Certificates under section 66—71	
Reduction works licences.....	3
Herring weir licences.....	Nil
Trap-net fishing licences.....	42
Salmon gill-net or drift-net licences.....	37
Salmon trap-net, pound-net or weir licences.....	207
Special angling permits.....	126
Smelt bag-net licences.....	43
Smelt gill-net licences.....	186
Otter or other trawl licences.....	1
	2,709

NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR D. H. SUTHERLAND

Lobster fishing licences.....	3,274 (3 cancelled)
Lobster packing licences.....	51
Lobster packing extensions—67	
Oyster fishery licences.....	110
Quahaug fishery licences.....	1
Shad gill-net or drift-net licences.....	5
Fish cannery licences.....	6
Certificates under section 66—95	
Reduction works licences.....	4
Seine licences.....	147
Herring weir licences.....	21
Trap-net fishing licences.....	91
Salmon gill-net or drift-net licences.....	376 (1 cancelled)
Salmon trap-net, pound-net or weir licences.....	180 (2 cancelled)
Special angling permits.....	146 (1 cancelled, 5 destroyed)
Scallop fishery licences.....	Nil
Lobster pound licences.....	6
Lobster pound certificates—188 (1 cancelled)	
Smelt bag-net licences.....	223
Smelt gill-net licences.....	249 (1 cancelled)
Otter or other trawl licences.....	5
	4,895 (8 cancelled and 5 destroyed)

NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

Kind of licences	Number of licences issued
Lobster fishing licences.....	2,941
Lobster packing licences.....	23
Lobster packing extensions—17 (1 cancelled)	
Shad gill-net or drift-net licences.....	3
Fish cannery licences.....	10
Certificates under section 66—155	
Reduction works licences.....	8
Herring weir licences.....	54
Trap-net fishing licences.....	138
Salmon gill-net or drift-net licences.....	281
Salmon trap-net, pound-net or weir licences.....	93
Salmon net permits.....	43
Special angling permits.....	849 (1 cancelled)
Scallop fishery licences.....	104
Lobster pound licences.....	14
Lobster pound certificates—460 (1 cancelled and 5 missing)	
Smelt bag-net licences.....	22
Smelt gill-net licences.....	72
Otter or other trawl licences.....	2
	<hr/> 4,657 (1 cancelled)

NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

Lobster fishing licences.....	414
Shad gill-net or drift-net licences.....	47
Fish cannery licences.....	11
Certificates under section 66—1	
Reduction works licences.....	4
Herring weir licences.....	650
Permits to dig soft-shell or long-neck clams.....	95
Salmon gill-net or drift-net licences.....	96 (1 destroyed)
Herring seine licences.....	7
Scallop fishery licences.....	38
Lobster pound licences.....	7
Smelt gill-net licences.....	Nil
Smelt bag-net licences.....	Nil
Lobster pound certificates—370	
Lease of Dark Harbour fishing privileges—1	
	<hr/> 1,369 (1 destroyed)

NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR H. E. HARRISON

Shad gill-net or drift-net licences.....	249
Sturgeon fishery licences.....	11
Whitefish fishery licences.....	15
Salmon net permits.....	160 (1 cancelled)
Gaspereau pound-net or trap-net licences.....	16
Salmon gill-net or drift-net licences.....	112
Salmon trap-net, pound-net or weir licences.....	100
Bass fishery licences.....	16
Smelt gill-net licences.....	Nil
Smelt bag-net licences.....	Nil
	<hr/> 679 (1 cancelled)

NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

Lobster fishing licences.....	1,834
Lobster packing licences.....	101 (1 cancelled)
Lobster packing extensions—67	
Oyster fishery licences.....	1,007
Quahaug fishery licences.....	76
Fish cannery licences.....	6
Certificates under section 66—228 (7 cancelled)	
Reduction works licences.....	1
Herring weir licences.....	1
Gaspereau pound-net or trap-net licences.....	51
Salmon gill-net or drift-net licences.....	135
Salmon trap-net, pound-net or weir licences.....	391
Lobster pound licences.....	6
Bass fishery licences.....	69
Smelt gill-net licences.....	295
Smelt bag-net licences.....	6,081
Lobster pound certificates—758 (1 blank and 31 missing)	
	<hr/> 10,054 (1 cancelled)

MARINE AND FISHERIES

PROVINCE OF MANITOBA—SUPERVISOR J. B. SKAPTASON

Kind of licences	Number of licences issued
Special angling permits.....	2,039
Pound-net licences.....	Nil
Special fishery licences.....	4,839 16 cancelled)
Domestic licences.....	1,440
Commercial sturgeon fishery licences.....	14 (1 cancelled)
Domestic sturgeon fishery licences.....	Nil
Receipt books—364 (2 cancelled)	
Reduction works licences (issued to Hudson Bay Co.).....	32 (4 Cancelled)
	8,364 (21 cancelled)

PROVINCE OF SASKATCHEWAN—SUPERVISOR G. C. MACDONALD

Special angling permits.....	555
Commercial and fisherman's fishery licences.....	1,186 (58 cancelled and 1 spoiled)
Domestic fishery licences.....	202 (3 cancelled)
Indian and half-breed permits.....	1,040
Commercial sturgeon fishery licences.....	Nil
Domestic sturgeon fishery licences.....	Nil
	2,983 (61 cancelled and 1 spoiled)

PROVINCE OF ALBERTA—SUPERVISOR R. T. RODD

Fish cannery licences.....	Nil
Special angling permits.....	8,408 (5 cancelled)
Indian and half-breed permits.....	1,080
Commercial and fisherman's fishery licences.....	1,256 (9 cancelled)
Domestic fishery licences.....	439 (1 cancelled)
Receipt books—1052 (9 cancelled)	
Pound-net licence.....	1
	11,184 (15 cancelled)

PROVINCE OF BRITISH COLUMBIA—CHIEF SUPERVISOR J. A. MOTHERWELL

Fish cannery licences.....	5
Reduction works licences.....	30
Special angling permits.....	540 (3 cancelled)
Indian permits.....	977
Metal tags—860	
Crab fishery licences.....	167
Smelt or sardine fishery licences.....	73
Sturgeon fishery licences.....	Nil
Miscellaneous licences.....	161
Salmon fishery licences.....	4,578
Salmon trolling licences.....	2,592 (1 cancelled)
Salmon trap-net licences.....	7
Salmon purse-seine licences.....	371 (16 cancelled)
Salmon drag-seine licences.....	24 (2 cancelled)
Licences to a captain of a salmon seine boat.....	278
Salmon curing licences.....	34 (1 cancelled)
Salmon cannery licences.....	71
Boat licences to buy fresh salmon from fishermen.....	255
Licences to a person engaged in cold storage or fish packing to buy fresh salmon from fishermen.....	91
Grayfish fishery licences.....	420 (4 cancelled)
Licences to assistant operator of salmon (purse or drag) seine....	1,882
Licences to assistant in a boat used in operating a salmon gill-net or drift-net.....	1,009 (4 cancelled)
Cod fishery licences.....	431
Herring or pilchard gill-net or drift-net licences.....	53 (1 cancelled)
Herring or pilchard purse-seine licences.....	117
Licences to a captain of a herring or pilchard (purse or drag) seine boat.....	117 (1 cancelled)
Herring or pilchard curing licences.....	28
Licences to assistant operator of herring or pilchard purse seine used under licence No.....	1,119
Herring pound licences.....	4
Whale factory licences.....	1
Counterfoil of pelagic sealing certificates—26	
	15,435 (33 cancelled)

YUKON

Special fishery licences.....	28 (1 cancelled)
-------------------------------	------------------

PACIFIC COAST

Licences to United States fishing vessels.....	273
--	-----

Total.....	66,239 (145 cancelled, 6 destroyed 2 spoiled)
------------	--

APPENDIX No. 12

RETURN SHOWING THE DETAILS OF PROSECUTIONS FOR OFFENCES AGAINST THE FISHERIES ACT
DURING THE FISCAL YEAR 1929-1930

NOVA SCOTIA, DISTRICT No. 1—SUPERVISOR, A. G. McLEOD

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	John McKenzie	Illegal fishing.	South Side river.	Fined \$1.00 and costs \$2.50.
2	Dan A. McLennan	Illegal salmon fishing.	Judique.	Fined \$5.00 and costs \$2.00.
3	Joseph McDougall	Illegal salmon fishing.	Judique.	Fined \$5.00 and costs \$2.00.
4	Angus McDougall	Illegal salmon fishing.	Judique.	Fined \$5.00 and costs \$2.00.
5	James Sampson	Illegal smelt fishing.	Orangedale.	Fined \$5.00 and costs \$1.50.

NOVA SCOTIA, DISTRICT No. 2—SUPERVISOR, D. H. SUTHERLAND

1	Charles Edwards.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
2	Frank Elliott.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
3	Will McNis.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
4	Richard Baker.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
5	Walter Brownell.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
6	Henry Fahie.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
7	James Myers.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
8	Lloyd Simpson.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
9	Angus Day.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
10	Allan Mills.	Setting lobster gear before opening date.	Fox harbour.	Fined \$15.00 and costs \$2.50.
11	Dan Fouchere.	Having berried lobsters in possession during close season.	Pictou Island.	Fined \$10.00 and costs \$7.60.
12	William Icton.	Having berried lobsters in possession during close season.	Purcell's cove.	Fined \$5.00.
13	Angus McCollough.	Pollution Debert River.	Debert river.	Fined \$20.00 and costs \$1.00.
14	Abraham Farris.	Illegal salmon fishing.	Sheet harbour.	Fined \$10.00 and costs \$1.10.
15	Leonard W. Pye.	Having berried lobsters in possession.	Halifax.	Fined \$5.00 and costs \$3.20.
16	William McWhirter.	Illegal salmon fishing.	Ramshead river.	Fined \$5.00 and costs \$1.00.

Return showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*NOVA SCOTIA, DISTRICT No. 2—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
17	Tyson Simmonds.....	Having in possession salmon during close season.....	Middle river.....	Fined \$30.00 and costs \$2.00.
18	Evert Hudson.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$15.00 and costs \$4.60.
19	Sherman Hallett.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$15.00 and costs \$4.60.
20	Robert Hudson.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$15.00 and costs \$4.60.
21	John D. Hudson.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$15.00 and costs \$4.60.
22	Percy Gay.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$15.00 and costs \$4.60.
23	William Martin.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$5.00 and costs \$0.40.
24	Arnold Hudson.....	Illegal salmon fishing.....	Country Harbour river.....	Fined \$5.00 and costs \$4.90.
25	Harry Skidmore.....	Having trout in possession during close season.....	Canaan Mountain.....	Fined \$15.00 and costs \$6.35.
26	Alex. Munroe.....	Illegal salmon fishing.....	Lawrence Bridge, Southampton.	Fined \$20.00 and costs \$2.25.
27	Samuel Allen.....	Illegal salmon fishing.....	East Southampton, railway bridge.	Fined \$20.00 and costs \$7.75.
28	John E. Daley.....	Illegal salmon fishing.....	Middle river.....	Fined \$50.00 and costs \$15.60.
29	Charles Daley.....	Illegal salmon fishing.....	Middle river.....	Fined \$50.00 and costs \$15.60.
30	Frank Murphy.....	Illegal salmon fishing.....	Westville.....	Fined \$5.00.
31	John A. McDougall.....	Illegal smelt fishing.....	Port Hillford.....	Fined \$30.00 and costs \$1.50.

NOVA SCOTIA, DISTRICT No. 3

1	Donald McInnes.....	Illegal trout fishing.....	Milton, N.S.....	Case dismissed, costs \$3.15.
2	Charles Whynot.....	Selling trout.....	Milton, N.S.....	Fined \$5.00 and costs \$1.50.
3	Raymond Anthony.....	Selling trout.....	Milton, N.S.....	Fined \$5.00 and costs \$1.50.
4	Melvin Huey.....	Selling trout.....	Milton, N.S.....	Fined \$5.00 and costs \$1.50.
5	Percy Oikle.....	Illegal fishing.....	Milton, N.S.....	Fined \$5.00 and costs \$0 cents.
6	Howard McKay.....	Illegal fishing.....	Upper Northfield.....	Fined \$10.00 and costs \$1.00.
7	Augustine Keddy.....	Illegal salmon fishing.....	Upper Northfield.....	Fined \$10.00 and costs \$1.00.
8	Arthur Keddy.....	Illegal salmon fishing.....	Salmon Hole Gold river.....	Fined \$50.00 and costs \$8.85.
9	Moyle Oxner.....	Illegal salmon fishing.....	Salmon Hole Gold river.....	Fined \$50.00 and costs \$8.85.
10	Albert Scott.....	Illegal salmon fishing.....	Still waters Gold river.....	Fined \$25.00.
11	Keuth Webber.....	Illegal salmon fishing.....	Still waters Gold river.....	Fined \$25.00.
12	Isaac Fenner.....	Illegal lobster fishing.....	Still waters Gold river.....	Fined \$25.00.
13	Frederick Cairnes.....	Illegal fishing.....	Gull islands.....	Fined \$10.00 and costs \$11.50.
			Brickton.....	Fined \$10.00 or 30 days in jail.
14	Thomas Goucher.....	Illegal fishing.....	Brickton.....	Fined \$10.00 or 30 days in jail.
				\$10.00.
				Fined \$10.00 or 30 days in jail.
				Costs
				\$10.00.

PRINCE EDWARD ISLAND—SUPERVISOR, S. T. GALLANT

1	Donald Gregg.....	Having oysters in possession in close season.....	Percival road.....	Fined \$10.00 and costs of court or 10 days imprisonment.
2	Jas. A. Champion.....	Having berried females in possession.....	Cape Egmont.....	Fined \$100.00 and costs of court or 6 months imprisonment.
3	John G. Arsenault.....	Having berried females in possession.....	Mount Carmel.....	Fined \$100.00 and costs of court or 6 months imprisonment.
4	Carl O'Hallaron.....	Fishing lobsters in close season.....	Cape Wolfe.....	Fined \$50.00 and costs of court.
5	Jas. O'Hallaron.....	Fishing lobsters in close season.....	Cape Wolfe.....	Fined \$50.00 and costs of court.
6	John E. Hardine.....	Having berried lobsters in his possession.....	Crown Point.....	Case withdrawn, each paying own expense.
7	Jas. Pealey.....	Not raising smelt gill-net, Sec. 18, Para. 8.....	Oyster Pound.....	Fined \$2.00.
8	Samuel LeBlanc.....	Having 2 smelt gill-nets set inside of limit.....	Etang du Nord.....	Fined \$1.00 and costs of court. Had confiscated 2 smelt gill-nets.
9	Russel Graig.....	Being in boat running lobster gear before 6 a.m.....	Malpeque harbour.....	Dismissed.
10	Geo. Champion.....	Being in boat running lobster gear before 6 a.m.....	Malpeque harbour.....	Sentence suspended. Fined \$10.00 and costs of court.
11	Jas. A. Champion.....	Setting lobster gear before 6 a.m.....	Malpeque harbour.....	Fined \$2.00 and costs of court.
12	Geo. A. Champion.....	Setting lobster gear before 6 a.m.....	Malpeque harbour.....	Fined \$10.00 and costs of court.
13	Michael Thomas.....	Fishing smelts in closed season.....	Charlottetown harbour.....	Fined \$20.00 or 30 days in jail and had confiscated from him 1 smelt net.
14	Frank Quoazzo.....	Fishing smelts with gill-net without licence.....	Montague.....	Sentence suspended. Fined \$1.00.

NEW BRUNSWICK, DISTRICT No. 1—SUPERVISOR, J. F. CALDER

1	Thaddeus Granes.....	Allowing sawdust to escape.....	Bustin brook.....	Fined \$20.00 and costs of court.
2	Henry Fawcett.....	Allowing sawdust to escape.....	North river.....	Fined \$20.00 and costs of court.
3	Arthur Walker.....	Fishing for shad with net in non-tidal waters.....	Near Power Bridge, Petitcodiac river.....	Fined \$25.00 and costs of court. Had confiscated 100 ft. of rope.
4	Dr. Connors.....	Illegally fishing for salmon with jig hooks.....	New River, Char. Co.....	Fined \$100.00 and costs of court. Had confiscated 1 rod, reel, line and doubled hooked fly.
5	Thomas Collier.....	Attempting to spear salmon.....	Petitcodiac river.....	Fined \$10.00 and costs of court. Had confiscated 1 salmon spear.
6	Charles Alward.....	Illegally fishing for salmon.....	Near Jones pool, Petitcodiac river.....	Fined \$100.00 and costs of court and had confiscated 23 salmon and 1 salmon net.
7	Blair Leaman.....	Illegally fishing for salmon.....	Near Jones pool, Petitcodiac river.....	Fined \$100.00 and costs of court.
8	Roy Spence.....	Illegally fishing for salmon.....	Near Jones pool, Petitcodiac river.....	Fined \$100.00.
9	Wm. MacLeod.....	Illegally fishing for salmon.....	Near Jones pool, Petitcodiac river.....	Fined \$100.00.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*
 NEW BRUNSWICK, DISTRICT No. 1—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
10	Hebert McNeil.....	Having lobsters in possession without lawful excuse	Deer Island, Char. Co.....	Not guilty.
11	Edgar Brown.....	Having lobsters in possession without lawful excuse	Yellow Bank, Campobello.....	Fined \$50.00 and costs of court. Had confiscated 23 illegal lobsters.
12	Thomas Call.....	Having lobsters in possession without lawful excuse	Barn Island, Char. Co.....	Allowed to stand. Had confiscated from him 12 illegal lobsters. Fined \$50 and costs.
NEW BRUNSWICK, DISTRICT No. 2—SUPERVISOR A. L. BARRY				
1	Peter E. Boucher.....	Violation of Sub-sec. 9, Sec. 21, Special Fisheries Regulations.	Nepisiguit river.....	Admonished.
2	Edmond Melanson.....	Having in his possession lobsters during such time prohibited by law.	St. Thomas, Kent Co.....	Fined \$50.00.
3	Cyrille Maillet.....	Having in his possession lobsters during such time prohibited by law.	Buctouche bay.....	Fined \$50.00 and had confiscated 80 lbs. of lobsters.
4	Frank Boudreau.....	Having salmon trap-net in fishing order on Sunday.	Restigouche River.....	Fined \$2.00, and warning.
5	Fidele LeBlanc.....	Having salmon trap-net in fishing order on Sunday.	Restigouche River.....	Fined \$2.00, and warning.
6	Edmond Boudreau.....	Having salmon trap-net in fishing order on Sunday.	Restigouche River.....	Fined \$2.00, and warning.
7	Philibert LeBlanc.....	Having salmon trap-net in fishing order on Sunday.	Restigouche River.....	Fined \$2.00, and warning.
8	John Nolan.....	Not having tags with name on salmon trap-net.	Restigouche River.....	Fined \$2.00, and warning.
9	Louis Giroux.....	Having salmon trap-net not tied up on Sunday.	Bay de Chaleur.....	Fined \$1.00.
10	See Pres. No. 28.			Fined \$2.00.
11	Leon Hudon.....	Scooping smelts in close season.	Rough Waters, Gloucester Co.	Case admonished.
12	Eugene Bourque.....	Fishing for smelts in close season.	Rough Waters, Gloucester Co.	Case admonished.
13	James Cormier.....	Having illegally caught lobsters in possession.	St. Thomas.....	Fined \$50.00 and had confiscated 40 lbs. of lobsters.
14	Adolphe LeBlanc.....	Leaving shore for fishing grounds with lobster fishing gear.	Little Cape.....	Fined \$5.00.
15	Henry Legere.....	Setting lobster fishing gear.	Little Cape shore.....	Fined \$10.00.
16	Jacob Legere.....	Setting lobster fishing gear.	Little Cape shore.....	Fined \$10.00.
17	Armand Ouellet.....	Leaving shore for fishing grounds with lobster fishing gear.	Little Cape shore.....	Fined \$5.00.
18	Jacob Allen.....	Not liberating spawn lobsters.	Cape Tormentine.....	Fined \$20.00.
19	Maxime Gagnon.....	Violation of Sec. 14, Special Fisheries Regulations.	Four roads.....	Fined \$25.00 and had confiscated 35 boiled lobsters.
20	Joe E. Arseneault.....	Violation of Sec. 14 Special Fisheries Regulations.	Four roads.....	Fined \$25.00 and had confiscated 1 tin boiler and one case of empty cans.

21	Martin Cassie.....	Fishing for lobsters in close season.....	Northumberland strait, Richibucto cape.	Fined \$50.00.
22	James Gardiner.....	Failing to return to public beds undersized oysters.	Miramichi Bay, Parish of Hardwicke.	Fined \$5.00, or 15 days in jail.
23	Stewart Williston.....	Failing to return to public bed undersized oysters.	Miramichi Bay, Parish of Hardwicke.	Fined \$5.00, or 15 days in jail.
24	Thomas Graham.....	Failing to return to public beds undersized oysters	Miramichi Bay, Parish of Hardwicke.	Fined \$5.00, or 15 days in jail.
25	Fred B. Martin.....	Drifting for salmon in Miramichi bay inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and cost of court, or 60 days in jail.
26	David Jenkins.....	Drifting for salmon in Miramichi bay inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
27	Lawson Taylor.....	Drifting for salmon in Miramichi bay, inside statutory line.	Miramichi Bay, Parish of Hardwicke.	Fined \$100 and costs of court, or 60 days in jail.
28	Wm. Chapman.....	Drifting for salmon in Miramichi bay inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
29	John Carroll.....	Drifting for salmon in Miramichi bay inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
30	Edmund Preston.....	Drifting for salmon in Miramichi bay inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
31	John Jenkins.....	Drifting for salmon in Miramichi bay, inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
32	William G. Mills.....	Drifting for salmon in Miramichi bay, inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
33	Allison Manuel.....	Drifting for salmon in Miramichi bay, inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
34	Michael Bransfield.....	Drifting for salmon in Miramichi bay, inside statutory line.	Miramichi bay, Parish of Hardwicke.	Fined \$100.00 and costs of court, or 60 days in jail.
35	E. Paturel.....	Buying illegal lobsters when fishing for such fish was prohibited.	Point du Chene.....	Not guilty.
36	Alderic Gallant.....	Having in possession a quantity of lobsters.	Point du Chene.....	Not guilty.
37	Gordon Murdock.....	Drifting for salmon in Miramichi bay, Northumberland Co....	Miramichi bay, Northumberland Co.	Fined \$100.00 and costs of court.
38	Richard Price.....	Fishing for salmon in close season.....	Tabusintac river.....	Allowed to stand. Fined \$50.00.
39	Alfred Stymiest.....	Fishing for salmon in close season.....	Tabusintac river.....	Allowed to stand. Fined \$50.00.

NEW BRUNSWICK, DISTRICT No. 3—SUPERVISOR, H. E. HARRISON.				
1	Edward Tomlinson.....	Water pollution.....	Odelle brook, Victoria Co.....	Fined \$20.00 and costs of court.
2	Sadler Lumber Co.....	Water pollution.....	Tobique river, Victoria Co.....	Fined \$20.00 and costs of court.
3	Berton Lyons.....	Fishing for gaspereau during weekly close season.....	South W. Miramichi river, McNamee.	Suspended sentence, and had confiscated salmon and gaspereau net. Fined \$50.00 and costs.
4	Campbell Dudley.....	Fishing for gaspereau during weekly close season.....	South W. Miramichi river, McNamee.	Suspended sentence. Fined \$50.00 and costs and had confiscated salmon and gaspereau net.
5	Burgess Lumber Co.....	Water pollution.....	Little river, Victoria Co.....	Fined \$20.00 and costs of court.
6	C. W. Lewis.....	Water pollution.....	Little river, Victoria Co.....	Fined \$20.00 and costs of court.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*
NEW BRUNSWICK, DISTRICT No. 3—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
7	George Delane.....	Fishing with small mesh net.....	Southwest Miramichi river.....	Fined \$10.00 and costs of court and had confiscated 1 gill-net.
8	Russell Bell.....	Fishing with small mesh dip-net and spear.....	Southwest Miramichi river.....	Fined \$10.00 and costs of court, and had confiscated a dip-net and spear.
9	Burgess Lumber Co.....	Water pollution.....	Little river, Victoria Co.....	Fined \$40.00.
10	Denis R. Martin.....	Killing fish by explosive.....	Baker brook, Madawaska Co.....	Information withdrawn.
11	Alex. Caron.....	Killing fish by explosive.....	Baker brook, Madawaska Co.....	Information withdrawn.
12	Eddy Caron.....	Killing fish by explosive.....	Baker brook, Madawaska Co.....	Information withdrawn.
13	Joseph Cote.....	Fishing for salmon with spear and torch.....	Salmon river, Victoria Co.....	Fined costs of court and had confiscated spear and torch, 1 auto, 1 boat, and oil.
14	Joseph Baird.....	Fishing for salmon with spear and torch.....	Salmon river, Victoria Co.....	Fined costs of court and had confiscated 1 spear and torch.
15	Felix Daigle.....	Fishing for salmon with spear and torch.....	Salmon river, Victoria Co.....	Fined costs of court and had confiscated 1 spear and torch.
16	Mert Hanson.....	Drifting for salmon.....	St. John river.....	Fined \$20.00 and costs of court, or 30 days in jail. Had confiscated 1 boat, 2 salmon and 1 net.
17	Will Segee.....	Drifting for salmon.....	St. John river.....	Fined \$10.00 and costs of court, or 7 days in jail.—Now suspended sentence.
18	John McDougall.....	Drifting for salmon.....	Southwest Miramichi river.....	Fined \$15.00 and costs of court, and had confiscated 4 salmon.
19	Thomas Ellison.....	Drifting for salmon.....	North Miramichi river.....	Fined \$15.00 and costs of court.
20	Talmage Currie.....	Refusing to pull his weir stakes out.....	St. John river, York Co.....	Fined \$5.00 and costs of court.
21	Henry Nowlan.....	Fishing for salmon.....	Northwest Miramichi river.....	Fined \$15.00 and costs of court and had confiscated 1 twine gill-net.
22	A. Jardine.....	Having illegally caught salmon in his possession.....	Quarryville, Northumberland Co.....	Fined \$50.00 and costs of court and had confiscated 500 lbs. salmon, or 2 months in jail.
23	Wm. Jardine.....	Having illegally caught salmon in his possession.....	Quarryville, Northumberland Co.....	Fined \$50.00 and costs of court and had confiscated 500 lbs. salmon, or 2 months in jail.
24	J. Hilton Hawkins.....	Water pollution.....	Nashwaaksis river, Douglas Co.....	Fined \$20.00 and costs of court. Suspended sentence.
25	Steadman Graves.....	Water pollution.....	Kennebecasis water, Kings Co.....	Fined \$20.00 and costs of court or one month in jail. Suspended sentence.
26	E. Hambrook.....	Fishing for salmon with net.....	Southwest Miramichi river.....	Fined \$15.00 and costs of court or one month in jail and had confiscated 1 salmon net.

27	Walter Hovey.....	Spearing salmon.....	Southwest Miramichi river.....	Fined \$5.00 and costs of court or 15 days in jail.
28	Roy Hovey.....	Spearing salmon.....	Southwest Miramichi river.....	Fined \$5.00 and costs of court or 15 days in jail.
29	Henry Hovey.....	Spearing salmon.....	Southwest Miramichi river.....	Fined \$5.00 and costs of court or 15 days in jail.
30	Edward Palmer.....	Spearing salmon.....	Southwest Miramichi river.....	Fined \$5.00 and costs of court or 15 days in jail.
31	H. P. Jones.....	Water pollution.....	Wild Meadow Brook.....	Fined \$20.00.

MANITOBA—SUPERVISOR, J. B. SKAPTASON

1	G. R. Dewar.....	Catching jackfish in close season, viol. Sec. 17, sub. sec. 2, F. R.	Westbourne dam.....	Fined \$5.00 and had confiscated 3 jackfish.
2	Knox Shust.....	Spearing fish, viol. sec. 20, sub. sec. 2, Fish Regs.	The Narrows, near Shoal Lake.....	Fined \$1.00 and costs of court or 10 days in jail.
3	Dick Yaskow.....	Spearing fish, viol. sec. 20, sub. sec. 2, Fish Reg.	The Narrows near Shoal lake.....	Fined \$1.00 and costs of court or 10 days in jail.
4	Lorne Robinson.....	Spearing fish, viol. sec. 20, sub. sec. 2, Fish. Regs.	The Narrows near Shoal lake.....	Fined \$1.00 and costs of court or 10 days in jail.
5	C. B. Spalding.....	Viol. Sec. 29, sub. sec. 1, Fish Act.....	Near Piggs Ranch, Oak lake.....	Fined \$10.00 and had confiscated 3 jackfish.
6	Elick Chericki.....	Fishing in closed season without permit.....	Red River about 2 miles below Lockport.....	Fined \$10.00 and had confiscated 1 short gill-net.
7	William Cybulsky.....	Fishing in closed season without permit.....	Red River about 2 miles below Lockport.....	Fined \$10.00 and had confiscated 1 short gill-net.
8	J. Lavoie.....	Viol. Sec. 2, sub. sec. c of the Fish. Reg.	Mouth of Whitemud river.....	Fined \$5.00 and had confiscated from him 2 pickerel, 9 jackfish and 2 gill-nets.
9	Chas. Yee.....	Having in possession fish in close season, viol. Sec. 29, Fish Act.	235 King St., Winnipeg.....	Fined \$50.00 and costs of court and had confiscated 300 lbs. pickerel.
10	Cyrus Cowell.....	Fishing with dip-net in fishway.....	Bellevue dam.....	Fined costs of court and had confiscated 1 dip-net.
11	Geo. Graham.....	Fishing with dip-net in fishway.....	Bellevue dam.....	Fined costs of court and had confiscated 1 dip-net.
12	Frank Cook.....	Fishing with spear in fish-way.....	Bellevue dam.....	Fined \$5.00 and costs of court and had confiscated 1 spear.
13	Jos. Schmidt.....	Having fish in possession, Sec. 29, Fish. Act.	The Pas.....	Fined \$25.00 and costs of court or one month in jail and had confiscated 200 lbs. pickerel.
14	Willington Ford.....	Fishing with net.....	Rock lake.....	Fined \$10.00 and had confiscated 1 net.
15	Sam Arber.....	Being in possession of illegal gill-nets.....	Berens river.....	Fined \$25.00 and had confiscated 59 gill-nets.
16	Conrad Michelson.....	Angling without permit.....	Lake Killarney.....	Fined \$5.00.
17	Einar Isfeld.....	Illegal fishing, viol. Sec. 4, sub. sec. 5 (a) of Fish. Regs.	Lake Winnipeg, Vic. Sandy Bar.....	Fined \$10.00 and had confiscated from him 6 gill-nets and 100 lbs. pickerel.
18	M. Bookbinder.....	Illegal fishing, viol. Sec. 4, sub. sec. 5 (a) of Fish. Regs.	Lake Winnipeg, Vic. Sandy Bar.....	Fined \$25.00 and had confiscated 4 gill-nets.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*MANITOBA—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
19	Jacob Walder.....	Angling without permit.....	Rock lake.....	Fined \$15.00 and had confiscated 11 jackfish.
20	J. Cohen.....	Having in possession fish in close season.....	276 Boyd Ave., Winnipeg.....	Fined \$15.00 and had confiscated 85 lbs. pickerel.
21	Eric Isfeld.....	Fishing illegal mesh nets, viol. Sec. 4, Para. 5, Fish. Regs.	Grand Beach Lake, Lake Winnipeg.	Fined \$15.00 and had confiscated 3 nets.
22	E. Bing.....	Angling without permit.....	Lake Killarney.....	Fined \$15.00 and costs of court.
23	R. L. Mayone.....	Angling without permit.....	Lake Killarney.....	Fined \$15.00 and costs of court.
24	C. J. Dyck.....	Angling without permit.....	Rock lake.....	Fined \$5.00 and costs of court.
25	H. A. Nickel.....	Angling without permit.....	Rock lake.....	Fined \$5.00 and costs of court.
26	Herman Heckardt.....	Unlawfully fishing by means other than angling.....	Whitemouth river near Tibauville.	Fined \$5.00 and costs of court and had confiscated 1 gill-net.
27	Jack A. Lowen.....	Unlawfully fishing by means other than angling.....	Whitemouth river, near Tibauville.	Fined \$5.00 and costs of court.
28	Theodore Halldorson.....	Illegal fishing, viol. sec. 4, sub. sec. 5A, Fish. Regs.	Lake Winnipeg, Vic., Little Bullhead.	Fined \$15.00 and had confiscated 4 gill-nets.
29	Gudberg Sigurdson.....	Illegal fishing, viol. sec. 4, sub. sec. 5A, Fish. Regs.	Lake Winnipeg, Vic., East Doghead.	Fined \$15.00 and had confiscated from him 2 gill-nets.
30	Wm. Hallson.....	Illegal fishing, viol. sec. 4, sub. sec. 5A, Fish. Regs.	Lake Winnipeg, Vic., East Doghead.	Fined \$15.00.
31	John Wielund.....	Fishing without licence, viol. Sec. 4, Sub. sec. 8, Fish. Regs.	Lake Winnipeg, Vic. Rabbit Pt.	Fined \$15.00.
32	R. Remsted.....	Fishing without licence, viol. Sec. 4, Sub. sec. 8, Fish. Regs.	Lake Winnipeg, Vic. Rabbit Pt.	Fined \$15.00.
33	Gunner Erickson.....	Fishing without licence, viol. Sec. 4, Sub. sec. 8, Fish. Regs.	Lake Winnipeg, Vic. Rabbit Pt.	Fined \$15.00.
34	Alex. Flecun.....	Fishing without licence, viol. Sec. 4, Sub. sec. 8, Fish. Regs.	Lake Winnipeg, Vic. Rabbit Pt.	Fined \$15.00.
35	M. Magnusson.....	Fishing with illegal mesh nets, Para. C, Sub. sec. 8, Sec. 4, Fish. Regs.	Lake Winnipeg, Vic. Rabbit Pt.	Fined \$100.00.
36	Jem Condon.....	Fishing in the Swan river with 2 nets.....	Vic. of Swan lake.....	Fined \$10.00 and had confiscated 2 nets.
37	Gilly Fordham.....	Fishing 2 nets undersize mesh.....	Lake Dauphin.....	Fined \$5.00 and had confiscated 2 nets.
38	Alex. N. Negrave.....	Fishing 4 nets, viol. Sec. 35 of Fish. Act.....	Swan lake, vic. Swan river.....	Fined \$10.00 and had confiscated 4 nets and 21 jackfish.
39	W. J. Woods.....	Viol. Sec. 20, Sub. sec. 2, spearing fish, Fish. Regs.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
40	Fred Levreault.....	Viol. Sec. 20, Sub. sec. 2, spearing fish, Fish. Regs.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.

41	A. Derroche.....	Viol. Sec. 20, Sub. sec. 2, spearing fish, Fish. Regs.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
42	C. MacNee.....	Viol. Sec. 20, Sub. sec. 2, spearing fish, Fish. Regs.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
43	John Scamp.....	Fishing with dip-net cont. Sec. 2, sub. sec. 1, F.R.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
44	A. Cooper.....	Fishing with dip-net cont. Sec. 2, sub. sec. 1, F.R.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
45	A. M. Freiman.....	Using illegal gill-nets viol. Sec. 9, sub. sec. D., Fish. Regs.	Rock lake.....	Fined \$10.00 and costs of court or 15 days in jail and had confiscated 1 dip-net.
46	Armstrong Ind. Fish.....	Using illegal gill-nets viol. Sec. 9, sub. sec. D., Fish. Regs.	Goose Island, Lake Man.....	Fined \$50.00 and costs of court and had confiscated 30 gill-nets.
47	Joe Brandon.....	Fishing illegal mesh nets, viol. sec. 4, sub. sec. 5, Fish. Regs.	Goose Island, Lake Man.....	Fined \$250.00.
48	Kristian Sigurdson.....	Viol. Sec. 4, F.R. and amending Order in Council No. P.C. 2224, Nov. 6/29.	Lake Winnipeg, Vic. Doghead Beach.....	Fined \$15.00.
49	Carl Anderson.....	Fishing without lic., viol. Sec. 2, sub. sec. 1, Fish. Regs.	Lake Winnipeg, Vic. McBeth Point.....	Fined \$20.00.
50	Roger Nabess.....	Fishing without lic., viol. Sec. 2, sub. sec. 1, Fish. Regs.	Lake Winnipeg, Vic. McBeth Point.....	Fined \$15.00.
51	Sveinn Gard.....	Fishing without lic., viol. Sec. 2, sub. sec. 1, Fish. Regs.	Lake Winnipeg, Vic. McBeth Point.....	Fined \$15.00.

SASKATCHEWAN—SUPERVISOR, G. C. MacDonald

1	Alf. Peterson.....	Fishing in closed season, cont. Sec. 12, Sub-sec. 2, F. Regs.	Vicinity of Big Arm, Long lake.....	Fined \$3.00 and had confiscated 1 rod, line and hook.
2	L. A. Dickson.....	Fishing in closed season, cont. Sec. 12, Sub-sec. 2, F. Regs.	Vicinity of Big Arm, Long lake.....	Fined \$3.00 and had confiscated 1 rod, line and hook.
3	John Cswrth.....	Fishing in closed season, cont. Sec. 12, Sub-sec. 2, F. Regs.	Vicinity of Big Arm, Long lake.....	Fined \$3.00 and had confiscated 1 rod, line and hook.
4	Albert Ehmon.....	Fishing in closed season, cont. Sec. 12, Sub-sec. 2, F. Regs.	Vicinity of Big Arm, Long lake.....	Fined \$3.00 and had confiscated 1 rod, line and hook.
5	Jacob Lutz.....	Fishing by means other than with gill-nets, fyke, hoop-nets, viol. Sub-sec. 1, Sec. 14, Fish. Regs.	Hyde dam.....	Fined \$5.00 and costs and had confiscated 1 dip-net.
6	Mat Lutz.....	Fishing by means other than with gill-nets or angling, viol. Sub-sec. 1, Sec. 14, Fish. Regs.	Hyde dam.....	Fined \$5.00 and had confiscated and costs 1 dip-net.
7	Frank Cooper.....	Fishing in closed season cont. Sec. 12, Sub-sec. 2, F. Regs.	Big Arm, near Liberty.....	Fined \$3.00 and costs of court.
8	Frank Cooper.....	Fishing cont. Sec. 14, Sub-sec. 3 of Spec. Fish. Regs.	Big Arm, near Liberty.....	Fined \$10.00 and costs.
9	J. H. Cooper.....	Fishing in closed season, cont. Sec. 12, Sub-sec. 2, Fish. Regs.	Big Arm, near Liberty.....	Fined \$3.00 and costs of court.
10	J. H. Cooper.....	Fishing cont. Sec. 14, Sub-sec. 3, Fish. Regs.	Big Arm, near Liberty.....	Fined \$10.00 and costs of court.
11	Adolph Keatings.....	Fishing cont. Sec. 12, Sub-sec. 2 of the Spec. Fish. Regs.	Devils lake, Sec. 17, Tp. 39, Rge. 5, W. of 2nd Mer.	Fined \$5.00 and costs and had confiscated 1 gill-net.
12	Alex. Falkenberg.....	Fishing cont. Sec. 21, sub-sec. 2 of the Spec. Fish. Regs.	Devils lake, Sec. 17, Tp. 29, Rge. 5, W. of 2nd Mer.	Fined \$5.00 and costs of court.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*SASKATCHEWAN—*Continued*

Pro- No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
13	Christian Fitenbuckle.....	Fishing cont. Sec. 12, Sub-sec. 2 of the Spec. Fish. Regs.	Devils lake, Sec. 17, Tp. 29, Rge. 5, W. of 2nd Mer.	Fined \$5.00 and costs of court.
14	Henry Stevner.....	Fishing cont. Sec. 12, Sub-sec. 2 of the Spec. Fish. Regs.	Devils lake, Sec. 17, Tp. 29, Rge. 5, W. of 2nd Mer.	Fined \$5.00 and costs of court.
15	Roy Rush.....	Fishing without a licence, Sub-sec. 1, Sec. 2.....	Pipestone creek, Sec. 7, Tp. 12, Rge. 30, W. of 1st Mer.	Fined \$5.00 and costs of court, and had confiscated 1 trap-net or 1 month in jail
16	Jack Cundy.....	Using spear, Sub-sec. 3, Sec. 14.....	Qu'Appelle river, near Bear Creek siding.	Fined \$5.00 and costs of court and had confiscated 1 spear.
17	John Crawford.....	Using spear, Sub-sec. 3, Sec. 14.....	Qu'Appelle river, near Bear Creek siding.	Fined \$5.00 and costs of court, and had confiscated 1 spear and 10 lbs. suckers.
18	Billy Williams.....	Using spear, Sub-sec. 3, Sec. 14.....	Qu'Appelle river, near Bear Creek siding.	Fined \$5.00 and costs of court, and had confiscated 1 spear.
19	W. J. Palmer.....	Using spear, Sub-sec. 3, Sec. 14.....	Qu'Appelle river, near Bear Creek siding.	Fined \$5.00 and costs of court.
20	Jacob Wendel.....	Angling during close season, Sub-sec. 2, Sec. 12.....	Hyde dam, Qu'Appelle river.	Fined \$10.00 and costs of court, and had confiscated hook and line.
21	Ewgruf Kobengwz.....	Having wire fish trap cont. to Sec. 14 (5), Regs.....	Englishman river.....	Fined \$5.00 and costs of court, or 7 days in jail and had confiscated 1 wire trap.
22	Harold Franklin.....	Fishing in close season cont. Sec. 12, Sub-sec. 2, Spec. Fish. Regs.	Big Arm, near Hinds point.....	Fined \$5.00 and costs of court, or 7 days in jail.
23	Martin Oberg.....	Snaring fish, cont. Sec. 14 (1), Spec. Fish. Regs.....	Turtle river.....	Fined \$5.00 and costs of court, or 7 days in jail, and had confiscated 1 wire snare
24	Emil Oberg.....	Snaring fish, cont. Sec. 14 (1), Spec. Fish. Regs.....	Turtle river.....	Fined \$5.00 and costs of court, or 7 days in jail, and had confiscated 1 snare, 11 fish.
25	Jacob Bondes.....	Fishing or preparing to fish by other means than angling, without a licence, cont. Sec. 2, Sub-sec. 1, F. R.	Qu'Appelle river.....	Admonished.
26	Jacob Bondes.....	Fishing or preparing to fish with illegal apparatus (dip-net).	Qu'Appelle river.....	Admonished. Had confiscated 1 wire dip-net.
27	Philip Wild.....	Fishing or preparing to fish by other means than angling, without a permit.	Qu'Appelle river.....	Fined \$5.00, or 7 days in jail.
28	Philip Wild.....	Fishing or preparing to fish with illegal apparatus, cont. Sec. 14, Sub-sec. 1 of the regs.	Qu'Appelle river.....	Fined the costs of court, or 7 days in jail, and had confiscated 1 wire dip-net.
29	Cosman Koankin.....	Taking fish cont. Sec. 14, Sub-sec. 1, Fish. Regs.....	Martin creek, Sec. 29, Tp. 46, Rge. 7, W. 3rd Mer.	Fined \$5.00 and had confiscated 4 pike.
30	H. Arnell.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Spec. Fish. Regs.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court, and had confiscated 1 dip-net and 1 drag-net.

31	H. Arneil.....	Fishing in closed season cont. Sec. 12, Sub-sec. 2, Spec. Fish. Regs.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court and had confiscated 30 lbs. suckers.
32	S. McIlroy.....	Fishing in prohibited area cont. Sec. 36, Fish. Act.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court, or 7 days in jail.
33	S. McIlroy.....	Fishing by other means than by angling, cont. to Sec. 14, Sub-sec. 1, Spec. Fish. Regs.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court, or 7 days in jail and had confiscated 90 lbs. suckers and pickerel.
34	John Anderson, alias E. Jacobson.	Fishing within 25 yards of the lower end of a fishway, cont. Sec. 36, Fish. Act.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court, or 7 days in jail.
35	John Anderson, alias E. Jacobson	Fishing with unbaited hooks cont. Sec. 14, Sub-sec. 4 of the Spec. Fish. Regs.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court, or 7 days in jail and had confiscated cane with unbaited hook.
36	John McLaren.....	Fishing in close season cont. Sec. 12, Sub-sec. 2, Spec. Fish. Regs.	Little Arm river.....	Fined \$5.00 and costs of court, or 7 days in jail.
37	John McLaren.....	Fishing with illegal apparatus cont. Sec. 14, Sub-sec. 3, Spec. F. R.	Little Arm river.....	Fined \$5.00 and costs of court, or 7 days in jail and had confiscated 1 pitchfork.
38	Jacob Tramour.....	Fishing by other means than angling, cont. Sec. 2, Sub-sec. 1, F. Regs.	Qu'Appelle river, Craven dist.	Fined \$5.00 and costs of court, and had confiscated 1 wire dip-net.
39	Jacob Tramour.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Fish. Regs.	Qu'Appelle river, Craven district.	Fined part of costs or court.
40	Anton Petrovich.....	Fishing by other means than angling, cont. Sec. 2, Sub-sec. 1, Regs.	Qu'Appelle river, Craven district.	Fined \$5.00 and costs of court and had confiscated 1 wire dip-net.
41	Anton Petrovich.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Fish. Regs.	Qu'Appelle river, Craven district.	Fined \$5.00.
42	Norman Wolfman.....	Fishing by other means than angling, cont. Sec. 2, Sub-sec. 1, Regs.	Qu'Appelle river, Craven district.	Fined \$5.00 and costs of court.
43	Norman Wolfman.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Fish. Regs.	Qu'Appelle river, Craven district.	Fined \$5.00 and had confiscated 1 wire dip-net.
44	P. Walter.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Fish. Regs.	Qu'Appelle river, Craven district.	Not guilty, but had confiscated 1 wire dip-net.
45	P. Walter.....	Fishing by other means than angling, cont. Sec. 2, Sub-sec. 1, Regs.	Qu'Appelle river, Craven district.	Not guilty.
46	W. Birnie.....	Fishing by other means than angling, cont. Sec. 2, Sub-sec. 1, Regs.	Qu'Appelle river, Craven district.	Not guilty.
47	W. Birnie.....	Fishing with illegal apparatus, cont. Sec. 14, Sub-sec. 1, Fish. Regs.	Qu'Appelle river, Craven district.	Not guilty.
48	J. W. Hobbs.....	Killing sturgeon cont. Sec. 4, Sub-sec. 7.....	Craven district.	Not guilty.
49	Dan Ehmon.....	Fishing by other means than angling, cont. Sec. 11, Sub-sec. 1, Spec. Fish. Regs.	North Sask. river, near Prince Albert.	Fined \$5.00 and costs of court and had confiscated 1 sturgeon.
50	Dan Ehmon.....	Fishing in a prohibited area, cont. Sec. 36, Fish. Act.	Qu'Appelle river, Craven dam	Fined \$5.00 and costs of court and had confiscated 12 lbs. fish.
51	C. Myers.....	Fishing in a prohibited area, cont. Sec. 36, Fish. Act.	Qu'Appelle river, Craven dam	Fined \$5.00 and costs of court and had confiscated 1 canvas kit bag.
52	C. Myers.....	Fishing by means other than angling cont. Sec. 14, sub. sec. 1, Spec. Fish. Regs.	Qu'Appelle river, Craven dam	Fined \$5.00 and costs of court, and had confiscated 5 lbs. fish.
53	H. Sveum.....	Fishing without permit cont. Sec. 2, S.S. 1, Fish. Regs.	Craven dam, Qu'Appelle river	Fined \$5.00 and costs of court.
54	Peder Sveum.....	Fishing without permit cont. Sec. 2, S.S. 1, Fish. Regs.	Frenchman river, Eastend district. Frenchman river, Eastend district.	Fined \$1.00 and had confiscated 1 short stick, line and 1 hook. Fined \$1.00 and had confiscated 1 short stick, line and 1 hook.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*SASKATCHEWAN—*Continued*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
55	Henry Ollenberg.....	Fishing without permit cont. Sec. 2, S.S. 1, Fish. Regs.	Qu'Appelle River, Lehman's Bridge.	Fined \$5.00 and costs and had confiscated 1 dip-net.
56	Joseph Friston.....	Having wire fish trap, cont. Sec. 14 (5) Fish. Regs.	Englishman river.....	Fined \$5.00 or 10 days in jail and had confiscated 1 wire fish trap.
57	Floyd Bowman.....	Fishing with illegal mesh, S.S. 1 of Sec. 11, Fish. Regs.	Qu'Appelle Lake, near Souix Bridge.	Fined \$5.00 and costs of court or 3 months in jail and had confiscated 1 gill-net and 7 lbs. of pickerel.
58	Henry Baker.....	Using net of illegal mesh, S.S. 1, Sec. 11, Fish. Regs.	Pasqua Lake, near Souix Bridge.	Fined \$10.00 and costs of court and had confiscated 2 gill-nets.
59	George Schinder.....	Using net of illegal mesh, S.S. 1, Sec. 11, Fish. Regs.	Pasqua Lake, near Souix Bridge.	Fined \$1.00 and costs of court.
60	H. W. Christianson.....	Fishing with a gill-net, cont. Sec. 11, sub. sec. 2, Fish. Regs.	Eagle Lake, at or near Sec. 25, Tp. 42, Rge. 19, W. 2nd Mer.	Fined \$5.00 and costs of court.
61	H. W. Christianson.....	Fishing with a gill-net cont. Sec. 2, Sub. sec. 11, Fish. Regs.	Eagle Lake, at or near Sec. 25, Tp. 42, Rge. 19, 2nd Mer.	Fined \$5.00 and costs of court and had confiscated 1 gill-net.
62	Reinald Schmuland.....	Fishing cont. Sec. 11, sub. sec. 2, Special Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
63	Reinald Schmuland.....	Fishing cont. Sec. 2, Sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00.
64	Alfred Schmuland.....	Fishing cont. Sec. 11, sub. sec. 2, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
65	Alfred Schmuland.....	Fishing cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
66	Gottlieb Schumland.....	Fishing cont. Sec. 11, S.S. 2, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$25.00 and costs of court and had confiscated 20 pike and 13 pickerel.
67	Gottlieb Schmuland.....	Fishing cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$10.00 and costs of court.
68	Adolph K. Minka.....	Fishing cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
69	Adolph K. Minka.....	Fishing cont. Sec. 11, Sub. sec. 2, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
70	Alex. Manka.....	Fishing cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
71	Alex. Manka.....	Fishing cont. Sec. 11, sub. sec. 2, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$1.00 and costs of court.
72	Jacob Manka.....	Fishing cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$10.00 and costs of court.

73	Jacob Manka.....	Fishing cont. Sec. 11, sub. sec. 2, Fish. Regs.....	At or near Sec. 17, Tp. 29, Rge. 5, W. 2nd M.	Fined \$25.00 and costs of court and had confiscated 27 pike, 16 pickerel, and 1 gill-net.
74	J. Maslen.....	Having in possession pickerel in close season cont. Sec. 29, Fish. Act.	Bethun.....	Fined \$10.00 and costs of court and had confiscated from him 4 lbs. pickerel.
75	Nick Fillochuk.....	Fishing with gill-net cont. Sec. 11, sub. sec. 2, Spec. Fish. Regs.	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer. Goose Lake	Suspended sentence and had confiscated 1 gill-net.
76	Nick Fillochuk.....	Fishing with gill-net, cont. Sec. 2, sub. sec. 11, Spec. Fish. Regs.	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer. Goose Lake	Suspended sentence.
77	Oli Koali.....	Fishing without licence cont. Sec. 2, sub. sec. 1, Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail.
78	Oli Koali.....	Fishing in prohibited area, cont. Sec. 9, sub. sec. 2, Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail and had confiscated 10 lbs. fish.
79	Oli Koali.....	Fishing with illegal mesh net cont. Sec. 11, sub. sec. 1, Spec. Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail.
80	A. Henriksen.....	Fishing in a prohibited area, cont. Sec. 9, sub. sec. 2, Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail and had confiscated 1 gill-net.
81	A. Henriksen.....	Fishing with illegal mesh net cont. Sec. 11, sub. sec. 1, Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail.
82	A. Henriksen.....	Fishing without licence cont. Sec. 2, sub. sec. 1, Fish. Regs.	Hines Pt., Big arm, near Liberty.	Fined \$10.00 and costs of court or 10 days in jail.
83	Alex. Groff.....	Fishing with gill-net, cont. Sec. 2, sub. sec. 11, Fish. Regs.	At or near Sec. 22, tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$25.00 and costs of court.
84	Alex. Groff.....	Fishing cont. Sec. 11, sub. sec. 2, Fish. Regs.....	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$1.00 and costs of court and had confiscated 1 gill-net.
85	John Groff.....	Fishing with gill-net, cont. Sec. 2, sub. sec. 11, Fish. Regs.	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$25.00 and costs of court.
86	John Groff.....	Fishing cont. Sec. 2 of the Spec. Fish. Regs.....	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$1.00 and costs of court.
87	Philip Jordon.....	Fishing with gill-net cont. Sec. 2, sub. sec. 11, Fish. Regs.	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$25.00 and costs of court.
88	Philip Jordon.....	Fishing cont. Sec. 11, sub. sec. 2, Fish. Regs.....	At or near Sec. 22, Tp. 28, Rge. 4, W. of 2nd Mer.	Fined \$1.00 and costs of court and had confiscated 1 gill-net.
89	William Mattila.....	Having in possession whitefish during close season, cont. Sec. 29.	Wm. Mattila's home.....	Fined \$5.00 and costs of court and had confiscated 14 whitefish.
90	Henry Peltier.....	Having in possession tullibee without lawful excuse in close season.	Katepwa.....	Fined \$100.00 and costs of court or 6 months in jail and had confiscated 600 lbs. tullibee and 30 lbs. pike, 50 lbs. pickerel, 30 lbs. whitefish.
91	Billy Fisher.....	Selling tullibee during close season, Sec. 29, F.A.....	Lebret.....	Fined \$5.00 and costs of court.
92	William Fisher.....	Selling tullibee during close season, Sec. 29, F.A.....	Fort Sam.....	Fined \$10.00 and costs of court or 2 months in jail.
93	Albert Perisian.....	Selling tullibee during close season, Sec. 29, F.A.....	Lebret.....	Fined \$5.00 and costs of court.
94	Charles Johnson.....	Being in possession of tullibee in close season, Sec. 29, F.A.	Round lake, N. Broadview.....	Fined \$10.00 and costs of court and had confiscated 3 gill-nets, and 90 lbs. of tullibee.
95	William Bordman.....	Being in possession of tullibee in close season, Sec. 29, F.A.	Round lake, Whitewood district.	Fined \$10.00 and costs of court and had confiscated 10 lbs. tullibee.
96	O. Norbick.....	Being in possession of tullibee in close season, Sec. 29, F.A.	Round lake, N. Broadview.....	Fined \$10.00 and costs of court.

RETURN showing the Details of Prosecutions for Offences Against the Fisheries Act During the Fiscal Year 1929-30—*Con.*SASKATCHEWAN—*Continued*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
97	Arthur Briere.....	Fishing with nets without licence, cont. Sec. 2 (1) of the Regs.	Helene lake.....	Fined \$50.00 and costs of court and had confiscated from him 2 gill-nets and 50 fish.
98	Milford Baudice.....	Fishing with nets without licence, cont. Sec. 2 (1) of the Regs.	Brightsand lake.....	Fined \$10.00 and costs of court or 30 days in jail and had confiscated 2 gill-nets.
99	Harvey Eaket.....	Fishing with nets without licence, cont. Sec. 2 (1) of the Regs.	Brightsand lake.....	Fined \$10.00 and costs of court or 30 days in jail and had confiscated 2 gill-nets.
100	Art Anderson.....	Fishing with illegal mesh net cont. Sec. 11 (1) of the Regs.	Turtle lake.....	Fined \$10.00 and costs of court or 30 days in jail and had confiscated 2 gill-nets.
101	Anders Anderson.....	Fishing with illegal mesh net cont. Sec. 11 (1) of the Regs.	Turtle lake.....	Fined \$1.00 and costs of court and had confiscated 1 gill-net.
102	Walter Elliott.....	Fishing with illegal mesh net cont. Sec. 11 (1) of the Regs.	Turtle lake.....	Fined \$10.00 and costs of court or 30 days in jail and had confiscated 27 lbs. fish and 1 net.
103	Sigurd Broten.....	Fishing with illegal mesh net cont. Sec. 11 (1) Regs.	Turtle lake.....	Fined \$10.00 and costs of court, or 30 days in jail, and had confiscated 2 gill-nets.
104	Wm. Csollang.....	Not keeping ice about his net-holes clean, cont. Sec. 15 of the Regs.	Dore lake.....	Fined \$10.00 and costs of court, and his licence cancelled.
105	William Messer.....	Leaving fish offal on ice, cont. Sec. 15, Regs.....	Flotten lake.....	Fined \$3.00 and costs of court.
106	Wm. Dreaver.....	Putting fish offal in water, frequented by fish, cont. Sec. 45 (3) of the Act.	Flotten lake.....	Fined \$3.00 and costs of court.
ALBERTA—SUPERVISOR, R. T. RODB.				
1	Gus Procknau.....	Using a spear and catching pike in close season.....	Astonin creek, Elk Island park.....	Fined \$10.00 and had confiscated 50 lbs. suckers, 10 pike and 1 spear.
2	Gris Ardt.....	Spearing fish in close season.....	Astonin creek, Elk Island park.....	Fined \$10.00 and had confiscated 50 lbs. suckers, 10 pike and 1 spear.
3	Ross Desjarlais.....	Fishing without Half-breed permit.....	Big bay, Lac la Biche.....	Fined \$5.00 and costs of court.
4	Mike Swedish.....	Having in possession goldeyes, cont. Sec. 29, Fish. Act.	North Lethbridge.....	Fined \$1.00 and costs of court and had confiscated 2 goldeyes.
5	Steve Stanko.....	Angling cont. Sec. 12 (2), Fish. Regs.....	Old Man river, near Lethbridge.....	Fined \$1.00 and costs of court and had confiscated 1 bamboo pole and 1 line.
6	Stanley Bryan.....	Setting nets before the season opens, cont. Para. 2, Sec. 13.....	Lac Ste. Anne.....	Fined \$10.00.
7	W. E. Moyer.....	Setting nets before the season opens, cont. Para. 2, Sec. 13.....	Lac Ste. Anne.....	Fined \$10.00.

8	A. S. Jones.....	Angling in the close season at a tributary.....	Elbow river, near Three Bridges.....	Fined \$2.00 and costs of court, and had confiscated 1 fishing rod.
9	B. Rentberch.....	Viol. Sec. 14, Para. 5, Fish. Regs.....	Goose creek.....	Fined \$10.00 and had confiscated from him 2 wicker traps.
10	James Noble.....	Using net without licence cont. Sec. 8, Para. B, Fish. Regs.....	Chin lake, East of Lethbridge.	Fined \$3.00 and had confiscated 1 gill-net
11	Henry Nelson.....	Using net without licence, cont. Sec. 8, Para. B., Fish. Regs.	Chin lake, East of Lethbridge.	Fined \$3.00 and had confiscated 1 gill-net
12	Andrew Burchak.....	Angling in close season cont. Sec. 12, Sub-sec. 2, Fish. Regs.	Oldman river, Lethbridge.....	Fined \$1.00 and costs of court.
13	Lawrence Davies.....	Infraction of Sec. 1, Para. B, Fish. Act—No permit	South Fork river, half-way between Cowley and Pincher Creek.	Fined \$6.00
14	David Harvey.....	Infraction of Sec. 1, Para. B, Fish. Act—No permit	South Fork river half-way between Cowley and Pincher Creek.	Fined \$6.00.
15	P. McLean.....	Fishing in a closed stream.....	Sullivan creek, tributary of the High river.	Fined \$50.00 and costs of court and had confiscated 1 fishing rod.
16	R. D. Graham.....	Fishing in a closed stream.....	Sullivan creek, tributary of the High river.	Fined \$50.00 and costs of court and had confiscated 1 fishing rod.
17	Charles Sheldon.....	Fishing without permit (angling), cont. Para. B., Sec. 1, Fish. Regs.	Cold lake.....	Fined \$5.00.
18	Hugh Vaght.....	Fishing without a permit (angling), cont. Para. B., Sec. 1, F. sh. Regs.	Cold lake.....	Fined \$5.00.
19	John Baden.....	Angling without permit, cont. Sec. 1, Para. B, Fish. Act., Sec. 32 old Act.	Lynden creek.....	Fined \$5.00.
20	W. E. Boode.....	Fishing without an angling permit.....	Clearwater river.....	Fined \$10.00 and costs of court.
21	E. F. Loose.....	Fishing without an angling permit.....	Clearwater river.....	Fined \$10.00 and costs of court.
22	Barney Tweet.....	Fishing without permit.....	Highwood river.....	Fined \$5.00 and costs of court and had confiscated 1 hook and line.
23	A. E. Davenport.....	Fishing in closed stream.....	Pekisko creek.....	Fined \$50.00 and costs and had confiscated 1 fishing rod.
24	Fred Andrews.....	Fishing in closed stream.....	Pekisko creek.....	Fined \$50.00 and costs and had confiscated 1 fishing rod.
25	H. Martin.....	Fishing without an angling permit.....	Highwood river.....	Fined \$5.00 and costs of court.
26	P. S. Knowles.....	Fishing without a disgorger.....	Sheep creek, North fork.....	Not guilty.
27	William Kerr.....	Fishing without an angling permit.....	Sheep creek, North fork.....	Not guilty.
28	Myke Myzzok.....	Angling in close waters cont. Sec. 14, para. 7, Fish. Act.	Pine creek.....	Fined \$10.00 and costs of court and had confiscated rod, reel, line and flies.
29	W. C. Vanderburgh.....	Angling without permit cont. Sec. 1, Para. B, Fish. Act.	Yarrow creek.....	Fined \$5.00 and costs of court.
30	Roy Auger.....	Fishing in closed stream.....	Pekisko creek.....	Fined \$50.00 and costs of court, and had confiscated 1 fishing rod.
31	Ernest Chapman.....	Fishing in closed stream.....	Pekisko creek.....	Fined \$50.00 and costs of court, and had confiscated 1 fishing rod.
32	D. Drinkwater.....	Fishing with a snare.....	Dogpond creek.....	Not guilty, but had confiscated the snare.
33	Walber May.....	Fishing with a snare.....	Dogpond creek.....	Not guilty.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1929-30—Continued

ALBERTA—Concluded

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
34	S. R. Camp	Fishing with a snare.	Dogpond creek.	Fined \$2.00 and costs of court, and had confiscated 1 snare.
35	Lester Foat	Fishing with a snare.	Dogpond creek.	Fined \$2.00 and costs of court and had confiscated 1 snare.
36	Bert Titus	Fishing with a snare.	Dogpond creek.	Fined \$2.00 and costs of court, and had confiscated 1 snare.
37	Mack Stigler	Having undersized trout in possession cont. Sec. 1, Para. 2, Fish. Act.	Pincher creek.	Fined \$10.00 and costs of court, and had confiscated 8 cut-throat and 1 string.
38	Geo. Gagnot	Having undersized trout in possession cont. Sec. 1, Para. 2, Fish. Act.	Pincher creek.	Fined \$10.00 and costs of court, and had confiscated rod, reel and line.
39	A. Kelsey	Angling in close waters, cont. Sec. 14, Para. 7, Fish. Regs.	Pine creek.	Fined \$5.00 and costs of court, and had confiscated 10 cut-throat trout.
40	R. R. Murray	Angling in close waters, cont. Sec. 14, Para. 7, Fish. Regs.	Pine creek.	Fined \$5.00 and costs of court.
41	R. R. Murray	Angling without permit, cont. Sec. 1, Para. B, Fish. Regs.	Near Pincher Pine creek.	Fined \$10.00 and costs of court.
42	A. Kelsey	Angling without permit, cont. Sec. 1, para. B, Fish. Regs.	Near Pincher Pine creek.	Fined \$10.00 and costs of court and had confiscated 10 cut-throat trout.
43	Lucien Bourbeau	Fishing with net unlawful size and length.	Cold lake.	Fined \$1.00 and had confiscated 1 gill-net also 1½ lb. of line.
44	Don Underwood	Violation of Sec. 2, Para. 1, Fish. Regs.	Obed lake.	Fined \$10.00 and had confiscated from him 1 gill-net.
45	O. K. Kolstad	Fishing with a snare.	Grease creek, a tributary of the Little Red Deer river.	Fined \$25.00 and costs.
46	J. J. Stewart	Fishing with a snare.	Grease creek, a tributary of the Little Red Deer river.	Not guilty.
47	Orne W. Lee	Angling in close waters, cont. Sec. 14, Para. 7, Fish. Regs.	Twin Buttes, Pine creek.	Fined \$15.00 and costs of court.
48	Marvin Popham	Angling in close waters, cont. Sec. 14, Para. 7, Fish. Regs.	Twin Buttes, Pine creek.	Fined \$20.00 and costs of court.
49	Geo. McDermott	Fishing with illegal gill-nets.	Lesser Slave lake.	Fined \$20.00 and had confiscated 2 gill-nets.
45A	O. H. Kolstad	Exceeding the per diem catch.	Grease creek, a tributary of the Little Red Deer river.	Not guilty.
50	F. Summers	Fishing without an angling permit.	Sheep Creek fork.	Fined \$5.00 and costs of court, and had confiscated 1 fishing rod.
51	Henry Moore	Fishing in the closed season.	The Elbow river.	Suspended sentence. Fined \$1.00 and costs.

52	H. Thompson.....	Fishing in the closed season.....	The Elbow river.....	Suspended sentence. Fined \$1.00 and costs.
53	Ed. McKenna.....	Fishing in closed season, cont. Sub-sec. B of Sec. 1.....	Pigeon lake.....	Fined \$25.00 and costs of court, and had confiscated 36 whitefish, 2 gill-nets.
54	Francis M. McKenna.....	Fishing in closed season, cont. Sub-sec. B of Sec. 1.....	Pigeon lake.....	Fined \$25.00 and costs of court.
55	Jas. McLeod.....	Fishing in closed season, cont. Sub-sec. B, of Sec. 1.....	Pigeon lake.....	Fined \$25.00 and costs of court.
56	Roderick LaRiviere.....	Having in possession whitefish in close season.....	St. Lina.....	Fined \$2.00 and costs of court, and had confiscated 6 whitefish.
57	S. R. Lundlie.....	Bartering whitefish in close season.....	St. Lina.....	Fined \$20.00.
58	Forrest Quick.....	Fishing in close season cont. Sub-sec. B, Sec. 1.....	Pigeon lake.....	Fined \$25.00 and costs of court, and had confiscated 1 gill-net and 729 lbs. whitefish.
59	Erie Quick.....	Fishing in close season, cont. Sub-sec. B, Sec. 1.....	Pigeon lake.....	Fined \$25.00 and costs of court.
60	John Thatchuk.....	Fishing for whitefish in close season.....	Whitefish lake.....	Fined \$10.00 and had confiscated 1 gill-net.
61	Wm. Koyezan.....	Fishing for whitefish in close season.....	Whitefish lake.....	Fined \$10.00 and had confiscated 1 gill-net and 6 pickerel.
62	The Ideal Coal Co.....	Pollution of a stream with mine refuse.....	Rosebud creek, Wayne.....	Fined \$100.00 and costs of court.
63	B. F. Brown.....	Unlawful possession of fish.....	T. L. Ranch, Sullivan creek.....	Case dismissed.
64	H. Berman.....	Unlawful possession of fish.....	T. L. Ranch, Sullivan creek.....	Case dismissed.
65	The Star Coal Mines.....	Pollution of a stream by permitting mine refuse to enter it.....	Red Deer river, Rosedale.....	Fined \$60.00 and costs of court.

BRITISH COLUMBIA—CHIEF SUPERVISOR, MAJOR J. A. MOTHERWELL

DISTRICT No. 1—SUPERVISOR, R. W. McLEOD (Acting)

1	Matt Reisanen.....	Having in possession undersized trout.....	Pretty creek.....	Fined \$15.00 and 3 small trout confiscated.
2	G. Dricas.....	In possession undersized clams.....	Vancouver.....	Fined \$10.00 and 45 lbs. clams confiscated.
3	{C. J. Colridge.....	Fishing with salmon roe.....	Capilano river.....	Case dismissed.
4	T. Colridge.....	In possession salmon roe.....	Capilano river.....	Fined \$1.00.
5	C. J. Colridge.....	Violation Sec. 15, Fishery Regulations.....	Stuart lake.....	Six months suspended sentence.
	Mrs. S. Lazor, Mrs. Moise, Mrs. J. Mathews, Mrs. L. Prince, Mrs. M. Celesta, Selina Aquin, Mrs. M. Lawrence, R. Seymour, Mrs. A. Tylie.	Obstructing Fishery Officer in discharge of duties.....	Stuart lake.....	Six months suspended sentence. Barcomb Song two months hard labour.
6	Mrs. M. Celesta, Mrs. A. Tylie, R. Seymour, Mrs. S. Lazor, Barcomb Song.	Violation paragraph 15j, Regulations.....	Monroe lake.....	Fined \$50.00 and rod, line, reel and creel confiscated.
7	Pete Brincivallie.....	Violation paragraph 15j, Regulations.....	Monroe lake.....	Fined \$50.00 and rod, line and hook confiscated.
8	Joe Guarascio.....	Violation paragraph 15j, Regulations.....	Monroe lake.....	Fined \$50.00 and landing net confiscated.
9	E. S. Bailey.....	Violation paragraph 15j, Regulations.....	Monroe lake.....	Fined \$50.00 and landing net confiscated.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1929-30—Continued

BRITISH COLUMBIA—DISTRICT No. 1—Continued

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
10	Harry Brown.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00 and hook, line and 7 sockeye salmon confiscated.
11	Iver Oakerman.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00 and hook, line and 7 sockeye salmon confiscated.
12	H. J. Blackstock.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00 and hook, line and 4 sockeye salmon confiscated.
13	A. Blackstock.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00 and hook, line and 4 sockeye salmon confiscated.
14	Chas. McManus.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00 and hook, line and 4 sockeye salmon confiscated.
15	A. E. McLeod.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00.
16	Fred McCaig.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00.
17	E. Tikagawa.....	Violation Sec. 29, Chap. 73, Fish. Act.....	N. Alouette river.....	Fined \$10.00.
18	(E. S. Coombs.....	Violation Sec. 21, Cl. 14, Regulations.....	Coldstream Creek.....	Gilty. Suspended sentence.
19	W. T. Acres.....	Fishing with dip net.....	Paul creek.....	Fined \$20.00 and dip net confiscated.
20	Alex. Thomas.....	Violation Sec. 2, Fishery Regulations.....	Crawford creek.....	Fined \$5.00 and rod, line and hooks confiscated.
21	John Kwasnie.....	Violation Sec. 2, Fishery Regulations.....	Crawford creek.....	Fined \$10.00 and pole, line and reel confiscated.
22	Geo. A. MacGregor.....	Fishing with net during closed season.....	North Arm Fraser river.....	Fined \$40.00 and boat, net and equipment confiscated.
23	Harry Begg.....	Fishing with net during closed season.....	Fraser river.....	Fined \$20.00 and boat, net and equipment confiscated.
24	B. H. Muench.....	Fishing with net during closed season.....	Fraser river.....	Fined \$15.00 and 150 lbs. abalone confiscated.
25	Yuen Fat Wah Jung Co.....	In possession Abalone during closed season.....	Vancouver.....	Fined \$2.50.
26	Eric Seaberg.....	Catching and retaining undersized trout.....	Seymour river.....	Suspended sentence.
27	I. Dehart.....	Catching and retaining undersized trout.....	Seymour river.....	Gilty. No fine imposed. 3 sockeye salmon confiscated.
28	Blind Tommy.....	Attempting to sell sockeye salmon.....	Quesnel.....	Fined \$3.50.
29	H. W. Hadland.....	Using salmon roe for bait.....	Capilano river.....	Fined \$25.00 and line, hook and 11 small trout confiscated.
30	Alfred Karlson.....	In possession undersized trout.....	Irishmans Creek.....	Fined \$1.00 and 2 small trout confiscated.
31	W. Vianna.....	Violation Sec. 24, s.s. 2b, Regulations.....	Bear Creek.....	Fined \$5.00.
32	G. Takahashi.....	Violation Sec. 24, s.s. 2b, Regulations.....	Fraser river.....	Fined \$5.00.
33	K. Owada.....	Violation Sec. 21, s.s. 5, Regulations.....	Fraser river.....	Fined \$20.00 and 5 lbs. cohoes and 10 pink salmon confiscated.
34	T. Koyanagi.....	Violation Sec. 13, and Sec. 29, Fish. Act.....	Vancouver.....	Case dismissed.
	D. Mori.....			

35	{C. A. Finch. D. F. Young. W. Torrance. S. Ohashi.....	Taking more salmon than allowed by regulations.....	Whitecliff.....	Suspended sentence imposed.
36	J. Kislish.....	Acting as boat puller on salmon gill-net boat without a licence.	Fraser river.....	Fined \$15.00.
37	L. Kislish.....	Acting as boat puller on salmon gill-net boat without a licence.	Fraser river.....	Fined \$15.00.
38	Edwin Salter.....	Acting as boat puller on salmon gill-net boat without a licence.	Fraser river.....	Fined \$15.00.
39	D. Patterson.....	Fishing with net less than 6½" mesh.....	Fraser river.....	Fined \$25.00.
40		Fishing with net less than 6½" mesh.....	Fraser river.....	Fined \$25.00 and 13 sockeye, 25 lbs. white spring, 44 lbs. coho, 84 pinks and 4 chums confiscated.
41	D. Cormack.....	Fishing for salmon with anchored net.....	Fraser river.....	Fined \$25.00.
42	A. Bendickson.....	Catching and retaining undersized trout.....	N. Alouette river.....	Fined \$1.00.
43	John Bakkim.....	Fishing during weekly closed time.....	Squamish.....	Fined \$25.00.
44	H. Iverson.....	Fishing during weekly closed season.....	Squamish.....	Fined \$25.00.
45	Joseph Gavin.....	Gaffing kokanee.....	Mill creek, Kelowna.....	Suspended sentence and gaff confiscated.
46	Chas. Keller.....	Gaffing kokanee.....	Mill creek, Kelowna.....	Fined \$5.00 and gaff confiscated.
47	H. Edwards.....	Gaffing kokanee.....	Okanagan river.....	Fined \$5.00 and gaff confiscated.
48	John Roberts.....	Gaffing kokanee.....	Kalamalka lake.....	Fined \$15.00 and gaff confiscated.
49	S. Parish.....	Taking kokanee with dip net.....	Okanagan lake.....	Fined \$5.00 and net confiscated.
50	H. R. Thomson.....	Gaffing kokanee.....	Long lake.....	Suspended sentence and gaff confiscated.
51	E. B. Hunter.....	Violation Sec. 31, Cl. 1 and 2, Regulations.....	Okanagan lake.....	Fined \$5.00 and gaff confiscated.
52	F. Gavin.....	Violation Sec. 21, Cl. 14, Regulations.....	Okanagan lake.....	Fined \$5.00 and gaff confiscated.
53	C. Pfoenhauer.....	Violation Sec. 31, Cl. 2, Regulations.....	Okanagan lake.....	Fined \$2.50 and gaff confiscated.
54	F. Pfoenhauer.....	Violation Sec. 31, Cl. 2, Regulations.....	Okanagan lake.....	Fined \$2.50 and gaff confiscated.
55	C. Ruske.....	Violation Sec. 31, Cl. 2, Regulations.....	Okanagan lake.....	Fined \$2.50 and gaff confiscated.
56	Alex. Gus.....	Violation Sec. 15, s. s. 3, Regulations.....	Seymour river.....	Case adjourned.
57	W. Aitken.....	Violation Sec. 21, Cl. 14, Regulations.....	Deep Creek.....	Fined \$5.00 and gaff confiscated.
58	Koji Iro.....	Gill-netting salmon in prohibited area.....	Howe Sound.....	Fined \$25.00.
59	Isaac Jacob.....	Gill-netting salmon in prohibited area.....	Howe Sound.....	Fined \$10.00.
60	Wm. Baker.....	Gill-netting salmon in prohibited area.....	Howe Sound.....	Fined \$15.00.
61	Alex. Gus.....	Violation Sec. 15, s. s. 3, Regulations.....	Seymour river.....	Fined \$1.00.
62	E. F. French.....	Jigging fish.....	Seymour river.....	Fined \$5.00. Line and few hooks confiscated.
63	G. Galpin.....	Jigging fish.....	Seymour river.....	Fined \$10.00. Line and few hooks confiscated.
64	Isaac Mack.....	Violation Sec. 15, s. s. 3b, Regulations.....	Harrison lake.....	Fined \$5.00.
65	Keijiro Matsui.....	Violation Sec. 15, s. s. 3b, Regulations.....	Harrison lake.....	Fined \$50.00.
66	Abraham Point.....	Violation Sec. 21, s. s. 6, Regulations.....	Coquitlam.....	Suspended sentence.
67	Paddy Thompson.....	Catching and having in possession undersized sturgeon. Selling fish caught under permit.	Devils Run, Fraser river.....	Fined \$50.00 on first charge and \$15.00 on second. In default 30 days hard labour.
68	George Billy.....	Violation Sec. 21, s. s. 15, Regulations.....	Dewdney.....	Fined \$2.00 and sturgeon line confiscated.
69	D. Mori.....	Buying salmon from Indian.....	Vancouver.....	Case withdrawn.
70	George Billy.....	Selling salmon caught under permit.....	Vancouver.....	Case dismissed.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1929-30—Continued

DISTRICT No. 2—SUPERVISOR, J. BOYD (ACTING)

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Ole Skog.....	Fishing for herring in prohibited area.....	Pearl harbour.....	Case dismissed.
2	Paul J. McMillan.....	Bringing fresh salmon from above tidal boundary.....	Naas river.....	Fined \$15.00 and 285 lbs. spring salmon confiscated.
3	John Locker.....	Illegally fishing for salmon in Yakoun river.....	Yakoun river.....	Fined \$1.00 and gill-net confiscated.
4	Thos. W. Kitson.....	Illegally fishing for salmon with trapnet.....	Copper Bay river.....	Fined \$25.00 and trapnet confiscated.
5	Jensuke Uwate.....	Fishing for sockeye during close time.....	Skeena river.....	Fined \$30.00.
6	Kichijiro Kada.....	Fishing for sockeye during close time.....	Skeena river.....	Fined \$30.00.
7	Keikichi Izumi.....	Fishing for sockeye during close time.....	Skeena river.....	Fined \$30.00.
8	Kichi Kanagai.....	Fishing for sockeye during close season.....	Portland Inlet.....	Fined \$30.00.
9	Alphonse Laruse.....	Fishing for salmon during closed season.....	Fisher channel.....	Fined \$35.00.
10	Kesahuchi Sawaki.....	Fishing with net over 200 fathoms long.....	Chatham Sound.....	Fined \$100.00, gill-net and 80 sockeye salmon confiscated.
11	J. H. Russ.....	Obstructing fishery officer.....	Naas river.....	Fined \$100.00.
12	Tomoleon Varlan.....	Assisting in operating gill-net without a licence.....	Rivers Inlet.....	Fined \$50.00.
13	Simon McKay.....	Refused to allow officer to search boat.....	Naas river.....	Case dismissed.
14	R. Munroe.....	Fishing above fishery boundary.....	Rivers Inlet.....	Fined \$20.00 and 80 salmon confiscated.
15	John Schooner.....	Fishing above fishery boundary.....	N. Bentinck Arm.....	Fined \$25.00, 7 pinks, 169 sockeye, 3 cohoes, 1 spring, a steelhead confiscated.
16	Charles Green.....	Fishing for salmon in closed area.....	Salmon seining area No. 3.....	Fined \$10.00.
17	Anton Anzulovich.....	Fishing for salmon during weekly closed season.....	Whale channel.....	Fined \$50.00.
18	Nathan Wilson.....	Fishing for salmon during weekly closed season.....	Neekis Inlet.....	Fined \$60.00.
19	Chester Jackson.....	Operating gill-net above fishing boundary.....	N. Bentinck Arm.....	Fined \$25.00, 2 cohoes, 76 pinks and 3 chums confiscated.
20	Jacobson (Indian).....	Fishing inside boundary.....	Rivers Inlet.....	Fined \$25.00.
21	Geo. Lewis.....	Fishing inside boundary.....	Rivers Inlet.....	Fined \$25.00.
22	P. Petersen.....	Fishing inside boundary.....	Rivers Inlet.....	Fined \$25.00.
23	E. Matice.....	Fishing inside boundary.....	Rivers Inlet.....	Fined \$25.00.
24	D. Fenton.....	Fishing inside boundary.....	Rivers Inlet.....	Fined \$25.00.
25	Chief Welch.....	Obstructing Fishery Officer.....	Naas River.....	Fined \$25.00.
26	Albert McKay.....	Obstructing Fishery officer.....	Naas river.....	Fined \$25.00.
27	John Stenswick.....	Fishing inside boundary.....	N. Bentinck arm.....	Fined \$100.00.
28	W. G. Barton.....	Fishing inside boundary.....	Beresford arm.....	Fined \$300.00.
29	Peter Leighton.....	Fishing inside boundary.....	Pacofi bay.....	Fined \$100.00 and 183 chums confiscated.
30	G. Olafson.....	Fishing inside boundary.....	George bay.....	Fined \$300.00 and 153 chums confiscated.
31	E. Clifton.....	Fishing inside boundary.....	Sewell Inlet.....	Fined \$300.00 and 15 chums confiscated.
32	J. Garner.....	Fishing inside boundary.....	Dana Inlet.....	Fined \$300.00 and 15 chums confiscated.

33	William Campbell.....	Fishing inside boundary.....	Sedgwick bay.....	Fined \$150.00 and 150 chums confiscated.
34	H. Brown.....	Fishing inside boundary.....	Ikeda bay.....	Fined \$150.00 and 72 chums confiscated.
35	D. Bernard.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25.00.
36	D. Morton.....	Fishing inside boundary.....	Pacofi bay.....	Fined \$150.00.

DISTRICT No. 3—SUPERVISOR E. G. TAYLOR.

1	Harry Steel.....	Violation Sec. 21, s.s. 12, Fishery Regulations.....	Cowichan river.....	Fined \$15.00, gill-net and 3 steelheads confiscated.
2	T. Butterfield.....	Violation Sec. 21, s.s. 2, Regulations.....	Barclay sound.....	\$100.00 bail estreated and salmon gill-net confiscated.
3	M. Suguria.....	Violation Sec. 24, s.s. 2a, Regulations.....	Knight inlet.....	Fined \$50.00 and gill-net confiscated.
4	Alfred Coon.....	Violation Sec. 21, s.s. 18a, Regulations.....	Kingcome inlet.....	Fined \$25.00.
5	Fred Dudward.....	Violation Sec. 29, s.s. 1, Regulations.....	Sartia bay.....	Fined \$25.00.
6	Dick Willie.....	Violation Sec. 21, s.s. 18a, Regulations.....	Maclack river.....	Fined \$100.00.
7	John Coue.....	Violation Sec. 15, s.s. 3b and 3c, Regulations.....	Duncan.....	Fined \$2.50.
8	Olav S. Vea.....	Violation Sec. 15, s.s. 1a, Regulations.....	Comox.....	Fined \$2.50, 108 chums and 31 cohoes confiscated.
9	George Harry.....	Violation Sec. 15, s.s. 3b, Regulations.....	Bute inlet.....	Fined \$25.00.
10	Oshane (Indian).....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan river.....	Fined \$20.00 and gill-net confiscated.
11	H. G. Beaveridge.....	Violation Sec. 21, s.s. 18b, Regulations.....	Little Qualicum river.....	Fined \$100.00, 7 cohoes, 1 spring and 74 chums confiscated.
12	William Norris.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan river.....	Fined \$20.00 1 piece net and 5 salmon chums confiscated.
13	Sammy Charlie.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan river.....	Fined \$50.00(confiscated.
14	Envid Hansen.....	Violation Sec. 21, s.s. 18, Regulations.....	Alberni canal.....	Fined \$20.00 and 68 chums confiscated.
15	Charles Kukalano.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan river.....	Case dismissed.
16	Fred Klein.....	Violation Sec. 21, s.s. 18a, Regulations.....	Pender harbour.....	Fined \$50.00 40 chums and 28 lbs. cohoes
17	Vincent Morford.....	Violation Sec. 21, s.s. 18a, Regulations.....	Pender harbour.....	Fined \$2.50 / confiscated.
18	Fred Klein.....	Violation Sec. 21, s.s. 2, Regulations.....	Pender harbour.....	Fined \$2.50.
19	Vincent Morford.....	Violation Sec. 21, s.s. 2, Regulations.....	Pender harbour.....	Fined \$2.50.
20	Andres Peterson.....	Violation Sec. 21, s.s. 18a, Regulations.....	Theodosia arm.....	Fined \$5.00.
21	Sture Lindstrom.....	Violation Sec. 21, s.s. 18a, Regulations.....	Oke-Over arm.....	Fined \$5.00.
22	Teresa Bob.....	Violation Sec. 21, s.s. 18a, Regulations.....	Theodosia arm.....	Fined \$5.00 and gill-net confiscated.
23	Ludwig Gulbranson.....	Violation Sec. 29, Regulations.....	Toba river.....	Fined \$5.00.
24	Carl Baardson.....	Violation Sec. 21, s.s. 18a, Regulations.....	Toba inlet.....	Case dismissed.
25	Alf Baardson.....	Violation Sec. 21, s.s. 18a, Regulations.....	Toba river.....	Case dismissed.
26	S. Tanaka.....	Violation Sec. 8, Regs. re dry salt herring.....	Reid island.....	Fined \$50.00.
27	S. Tanaka.....	Violation Sec. 8, Regs. re dry salt herring.....	Reid island.....	Fined \$50.00.
28	Oskar Backman.....	Violation Sec. 21, s.s. 18a, Regulations.....	Oke-Over arm.....	Fined \$20.00.
29	Antti Mettinen.....	Violation Sec. 21, s.s. 18a, Regulations.....	Oke-Over arm.....	Fined \$20.00.
30	John Chambers.....	Violation Sec. 21, s.s. 18a, Regulations.....	Oke-Over arm.....	Fined \$20.00.
31	John Chambers.....	Violation Sec. 15, s.s. 4, Regulations.....	Oke-Over arm.....	Fined \$5.00.
32	Nathan Lawson.....	Violation Sec. 21, s.s. 29r, Regulations.....	French creek.....	Fined \$100.00, 57 cohoes and 76 chums
33	Donet Charlie.....	Violation Sec. 21, s.s. 12, Regulations.....	Cowichan bay.....	confiscated.
34	Gunnard Magnuson.....	Violation Sec. 36, Fisheries Act.....	Skutz Falls.....	Case dismissed, 34 cohoes confiscated.
				Fined \$2.50.

RETURN showing the Details of Prosecution for Offences Against the Fisheries Act During Fiscal Year 1929-30—*Concluded*

DISTRICT No. 3—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
35	Doris Magnuson.....	Violation Sec. 36, Fisheries Act.....	Skutz Falls.....	Fined \$2.50
36	Alfred Bradford.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano Island.....	Fined \$100.00, 40 fath. herring purse-seine confiscated.
37	Yip Sang Co., Ltd.....	Violation Sec. 14, s.s. 1f, Regulations.....	Otter bay.....	Fined \$100.00, 48 fath. herring purse-seine confiscated.
38	S. Tanaka & Co.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano island.....	Fined \$100.00, 36 fath. herring purse-seine confiscated.
39	Moresby Is. Fisheries.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano island.....	Fined \$100.00, 47 fath. herring purse-seine confiscated.
40	Otter Bay Fishing Co.....	Violation Sec. 14, s.s. 1f, Regulations.....	Pender island.....	Fined \$100.00, 25 fath. herring purse-seine confiscated.
41	B.C. Packers, Ltd.....	Violation Sec. 14, s.s. 1f, Regulations.....	Pender island.....	Fined \$100.00, 20 fath. herring purse-seine confiscated.
42	Canadian Fishing Co., Ltd.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano island.....	Fined \$50.00, 18 fath. herring purse-seine confiscated.
43	Pacific Salteries, Ltd.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano island.....	Fined \$50.00, 16 fath. herring purse-seine confiscated.
44	Wm. Beck.....	Violation Sec. 14, s.s. 1f, Regulations.....	Galiano island.....	Fined \$125.00, 78 fath. herring purse-seine confiscated.
45	Amos Dawson.....	Violation Sec. 21, s.s. 13b, Regulations.....	Owens bay.....	Fined \$25.00.
46	Wesley Butterfield.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan bay.....	Fined \$5.00 } Boat and gear and 100 lbs. cod confiscated.
47	Ammon Butterfield.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan bay.....	Fined \$5.00 }
48	Chas. Coats.....	Violation Sec. 21, s.s. 12b, Regulations.....	Cowichan bay.....	Fined \$2.50 }
49	Wesley Butterfield.....	Violation Sec. 6, s.s. 2, Regulations.....	Cowichan bay.....	Fined \$2.50.
50	Ammon Butterfield.....	Violation Sec. 6, s.s. 2, Regulations.....	Cowichan bay.....	Fined \$2.50.
51	Chas. Coats.....	Violation Sec. 6, s.s. 2, Regulations.....	Cowichan bay.....	Fined \$2.50.

Offender	Nature of Offence	Place of Offence	Result of Prosecution
Catherine B.....	Illegally fishing inside territorial waters of Canada.....	Rose Spit, Q. C. I.....	Boat condemned.
Salmon Troller 557 G. A.....	Illegally fishing inside territorial waters of Canada.....	West coast Vancouver island.....	Boat condemned.
Olimpos.....	Illegally fishing inside territorial waters of Canada.....	West coast Vancouver island.....	Boat condemned.
Mary C. Fischer.....	Alleged entry for purposes other than wood, water, shelter or repairs.....	Rose Spit, Q. C. I.....	Dismissed.
Tacora.....	Alleged entry for purposes other than wood, water, shelter or repairs.....	Goose islands.....	Dismissed with costs against Crown.
May.....	Alleged entry for purposes other than wood, water, shelter or repairs.....	Goose islands.....	Dismissed with costs against Crown.
We.....	Alleged entry for purposes other than wood, water, shelter or repairs.....	Goose islands.....	Dismissed. No costs.
Jeannette.....	Alleged entry for purposes other than wood, water, shelter or repairs.....	Goose islands.....	Dismissed. No costs.

Zool.

Zool

